



# Amateur Radio

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## Women in Radio

meet

**Dorothy Bishop VK2DB**  
and **Joy Charles VK5YJ**

2 new articles by  
**Peter Parker VK3YE:**

**The 'NoPA' 40 metre DSB transmitter**  
*Novel design uses no RF power amplifier*

**New life for your old broadcast receiver**  
*Listening pleasure past the top of the dial*

ISSN 0002-6859



- **COCKY-PROOF** those antennae
- Using Crystal Oscillator Modules
- What's all this *Linux* business?

- Another use for ex-computer crystals
- 12 to 28 Volt DC - DC Converter

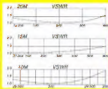
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# Amateur Radio

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## General

Cocky-proof those antennae!	8
Bernie McIvor VK4EJ	
What's all this Linux business?	13
Peter Barrett VK6PEC	
Women in Radio	24
Christine Taylor VK5CTY	
Entry Level Licence: WIA Consultation Survey findings	30
Jim Linton VK3PC	
Product Review: ICOM IC-910H VHF/UHF Multimode Transceiver	50
Doug McArthur VK3UM	

## Technical

The 'NoPA' 40 metre DSB transmitter	4
Peter Parker VK3YE	
Using Crystal Oscillator Modules	11
Peter O'Connell VK2EMU	
Another use for ex-computer crystals	12
Steve Mahoney VK5AIM	
12 to 28 Volt DC - DC Converter	15
Keith Gooley VK5QQ	
New life for your old broadcast receiver	21
Peter Parker VK3YE	

## Columns

ALARA	27	Editor's Comment	2
AMSAT	45	Hamads	54
ARDF	14	Ham Shack Computers	39
Beyond Our Shores	29	How's DX	36
Contests	41	HF Predictions	48
Club News	26	Over to you	7
WIA Division News		Silent Keys	28
VK1 Notes	32	Swing	10
VK2 Notes	33	VHF UHF an expanding world	52
VK3 Notes	34	WIA Comment	3
VK7 Notes	35	WIA Division Directory	56
		WIA Federal Directory	2

## Our Cover this month

One of the many women involved in amateur radio, Dorothy Bishop  
VK2DB. Read her story and that of Joy Charles VK5YJ on pages 24 & 25

### Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, How to write for Amateur Radio is available from the Federal Office on receipt of a stamped self-addressed envelope.

### Back Issues

Back issues are available directly from the WIA Federal Office (until stocks are exhausted), at \$4.00 each (including postage within Australia) to members.

### Photostat copies

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### Disclaimer

The opinions expressed in this publication do not necessarily reflect the official view of the WIA and the WIA cannot be held responsible for incorrect information published.

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A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs; that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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## Editorial Comment

Colwyn Low VK5UE

## A group of experimenters!

This month sees the debate on the Entry level licence proposal heat up. We do have to get a comment from a large number of Amateurs with different interests and varying time as operators. We also have to try and redefine what Amateur radio is all about. What is amateur radio in 2003? Is the statement at the top of page 56 still true and if so, what does it mean in sentence 1 and is the limitation in sentence 2 to 'radio technique' too restrictive in to-days world? I have said before we really are non-commercial communicators using electromagnetic radiation and other electrical systems to communicate. If we are too restrictive we will wither and die as a hobby but people will still link their computers with radio links and copper wires and optical fibre. We

will be the losers if we do not spread our defined areas of interest.

I know new activities with new modes can be a challenge but then we are supposed to be a group of experimenters. I have been thinking I should get a computer linked to one of my transceivers for something more than packet. Should I just run a connection to a bulletin board, which is what my packet system does most of the time. The rest of my packet operation is assisting WICEN with the scoring net for the Cooper's Pale Ale Rally SA and the Classic Adelaide Rally.

I read with interest the summary of the British three-tier licence system in Short Wave magazine at the local newsagent on 17th June. The article covered the whole licence range and how you got the licences and progressed from one to the

other. It did seem to require more work, but at least new licencees were in contact with other more experienced amateurs and so were building up a network of Elmers and gaining practical experience on the way. Our greater distances here in Australia would add to the problems of implementation but then are Australians not reputed to be 'fix it' gurus with a "she'll be right mate" attitude to problem solving.

Keep thinking about the above and discussing it with those you meet at the Local Radio Club or on your favourite Net. Strangely it is very true of all volunteer/hobby activities that you only get out what you put in and it does become a "nothing in; nothing out" situation.

So how about the RD Contest and remembering why we hold it? How about working the ALARA Contest? How about just operating?

So keep operating and experimenting because that is what Amateur Radio is all about.

73 Colwyn VK5UE

## "Hey, Old Timer..."

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## Fielding questions on Foundation Licence

The last month has been occupied with questions about the proposed foundation licence. As I indicated in the June issue of AR, the overall process will take considerable consultation across the whole amateur radio community. A number of amateurs have been very critical that the WIA has not at this early stage of the consultation process provided them with all of the details that they are seeking. Please bear with us – consultation means that we cannot know the end result until after we have sought your views. I would like to thank all of the amateurs across Australia who have contributed to the debate especially those that have run their own independent surveys (including Owen Duffy VK1OD at [www.cqvk.net](http://www.cqvk.net), and Alan Meredith VK2CA at [www.vkham.com](http://www.vkham.com)). All this activity has served to highlight the need for review and I hope that the process that is outlined below will achieve this.

As part of the overall process I met with the ACA in late May to brief it about progressing the new Entry level licence proposal. Although the WIA survey on the foundation licence is still in progress I believe that it is important that we work closely with the ACA throughout the coming months to ensure that both groups maintain a clear understanding of what we are trying to achieve. The aim of the meeting was to brief ACA personnel about the WIA Foundation Licence proposal.

The informal briefing proved to be very productive and the ACA used the opportunity to set out some of its thoughts about the future of amateur radio regulatory arrangements in Australia. The detailed options are still very much under active consideration by the ACA. The ACA is currently developing a comprehensive discussion paper that it will publish for public comment shortly after the end of the 2003 World Radiocommunication Conference. Some of the drivers for change include:

- The likely removal of the ITU requirement for Morse Code testing as a part of amateur radio qualifications.

- The changing role of the ACA. This may involve the devolution of a number of administrative tasks to external organisations.
- Recognition of the need for change to reflect modern operating conditions.
- The recommendations of the Productivity Commission.

The range of topics that will be addressed by the ACA discussion paper will be broad. Examples of some of the topics that are expected to be addressed include:

- The effect of the changes to Article 25 of the ITU's Radio Regulations.
- The form and structure of amateur radio licensing.
- The administration of amateur radio examinations, certificates and call signs.
- Whether a 'Foundation' licence has any place in the Australian context.
- Reciprocal licensing.

Given the wide ranging nature of the possible changes, the ACA will write to all amateurs seeking their comments about the discussion paper. The discussion paper is expected to be available on the ACA's web site in August 2003 and a suitable period will be allowed for amateurs to consider the proposals and make submissions. Based on the submissions the ACA hopes to be in a position to advise amateurs about its decisions by early 2004. The supporting legislation will then need to be made and

policy documentation drafted. At this time it is expected that this activity will take some ten months to complete. The new Australian regulatory arrangements are expected to be introduced in the first quarter of 2005.

The WIA, as the representative body for the amateur radio service in Australia, will be using its network of clubs and officers, along with the current foundation licence survey to assemble its formal response to the ACA discussion paper. As always, I would

urge any amateur radio operator to make every effort to speak to his or her WIA councillor to make their views known. Alternatively, I would be delighted to hear from any amateur directly about their views on the proposals at [president@wia.org.au](mailto:president@wia.org.au) or via mail to PO Box 691, Dickson, ACT 2602.

For those of you who would like to gain a feel for how the implementation process will unfold I have prepared a "first guess" project Gantt chart, which will be published in next month's AR, to give some idea of the proposed implementation timetable. It goes without saying that this first draft will change once we better understand the scope and interrelationships between the various tasks. I have based the forecast on the assumption that we can complete all of the work by the first quarter of 2005. A more definitive timetable will be issued as soon as is practical. Please though note that as in all such endeavours the plan will need to evolve as more information becomes available to us.

At the moment a number of members of the WIA executive, council and Federal coordinators are working on the implementation process. Tasks include looking at overall process and the documentation issues, reviewing the educational and examination issues, as well as looking at the business issues.

Many others are actively promoting the licence at Divisional level. We will be looking for volunteers to assist with a whole range of activities in due course.

In these notes I have not had a chance to comment on the progress of WRC2003 itself. I hope that by the time of the next issue to be able to provide some information on the outcomes of the conference in respect of the changes that will have a specific impact upon the amateur radio service. So 73s for now and I look forward to hearing your comments, either directly or via the divisions. All the best in amateur radio.

ar

# The 'NoPA' 40 metre DSB transmitter

## Novel design uses no RF power amplifier

Peter Parker VK3YE

12/8 Walnut Street, Carnegie, 3163

Email: parkerp@alphalink.com.au, Web: <http://www.qsl.net/vk3ye>

**Resurrecting an old technique with modern components. That's the main claim of the 'NoPA', an experimental minimum parts double sideband transmitter. This unique design uses no obscure ICs or touchy linear amplifier stages. Instead it uses modern FETs to generate high-level double sideband coupled direct to the antenna. Though no free-running VFOs or complex frequency synthesisers are used, excellent frequency agility is provided.**

The NoPA covers a popular segment of 40 metres, but conversion to 80 or 160 metres should be possible. Other applications include use with a direct conversion receiver to provide transceive operation and the application of the audio and balanced modulator stages to provide an outboard DSB adapter for CW transmitters. Further ideas on improvements are given later.

### Circuit Description

The NoPA obtains its wide frequency coverage by way of a ceramic resonator VFO/multiplier developed by Leon Williams VK2DOB (Reference One). A 3.58 MHz ceramic resonator is pulled to generate 3.520 to 3.600 MHz in a 74HC04 oscillator circuit. This is doubled by the 74HC86 stage to cover 7.040 to 7.200 MHz, which encompasses the most active portion of the 40 metre phone segment. Finally the 7 MHz signal is amplified by a second 74HC04 with all gates in parallel. Readers wanting a detailed description of how the doubler works are referred to Reference One.

The heart of the transmitter is the power balanced modulator. Rather than generating a low-level signal and amplifying it via several stages, the NoPA generates the DSB at high power, negating the need for subsequent amplifier stages. This method was chosen for several reasons. The first was simplicity. Another was its potential as a 'DSB converter unit' for owners of CW-only transmitters. Also attractive was the opportunity to revive a still-useful technique that had seen little amateur use since the valve days.

Reference Two provided the basis of the power balanced modulator stage in the prototype. This VK3WV design was a crystal-controlled 80 metre DSB transmitter. A pair of pentodes formed the balanced modulator. RF was applied to both control grids (wired in parallel), while audio was fed push-pull to both screen grids via a centre-tapped modulation transformer.

The first problem faced with using a FET was the lack of an equivalent to the screen grid. This meant that both RF and audio had to be applied to the FET gates. Experimentation with several arrangements led to the circuit shown here. Note the application of gate bias through the transformer's centre tap. It was also decided to use a broadband toroid followed by a pi-network to couple the output into the antenna rather than the parallel tuned circuit of the valve design. As with the valve circuit, no balance adjustment has been found necessary. No provision has been made for AM or CW operation.

The modulation transformer is a back-to-front centre-tapped 1k - 8 ohm speaker transformer. This required an audio amplifier capable of driving an 8-ohm load directly. Use was made of a conventional LM386 amplifier and transistor preamp in this application.

Transmit/receive switching consists of the PTT switch on the microphone and the transmit-receive relay. This can be any standard 12 volt-operated DPDT relay. One set of relay contacts switches the antenna between the transmitter and the receiver, and another applies power to the transmitter. Note that during received the power is removed from the entire transmitter; keeping the oscillator running may spoil reception of weak signals unless its signal is used to provide a BFO for an AM receiver or external direct conversion receiver. Though oscillator switching could reduce short-term frequency stability, no problems have been noted in practice.



Photo 1: Front view of NoPA

## Parts availability

Surprisingly few components used in the NoPA are in the 'hard to get' category.

The variable capacitor used was a salvaged air-spaced type, though one section of a newer 60/160pF plastic dielectric unit should also work. The 3.58 MHz ceramic resonator came from RS Components. The author still has some spare ceramic resonators available for the cost of a stamped addressed envelope sent to the above address. The IRF510s came from Rockby Electronics in Melbourne. The 1k:8 ohm transformer were purchased from Dick Smith Electronics. Truscott's Electronics World in Croydon South supplied all toroids used. The prototype used salvaged silver mica capacitors in the pi network, though polystyrene capacitors (use two in parallel to obtain the required value if required) also provide low loss and are available from DSE. The microphone used was an ex-telephone earpiece, though almost anything from an old VHF two-way radio will also work.

## Construction

As this transmitter is designed for the experimenter who has already built several QRP transmitters, only limited constructional information is provided.

The first step is to assemble the ceramic resonator oscillator, doubler and amplifier stages. Apart from the use of

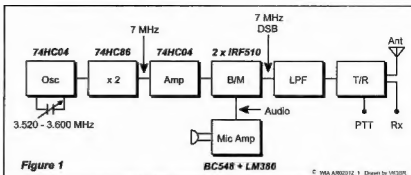


Figure 1: Block diagram NoPA

two 74HC04s instead of one (to provide more drive to the balanced modulator), the circuitry is the same as in Reference One. Two pieces of plain matrix board were used to mount the components. To prevent possible feedback and instability problems, a metal partition separates these stages from the rest of the transmitter.

The capacitor values shown provide 7.040 - 7.200 MHz coverage with a 3.58 MHz ceramic resonator from RS Components. However other ceramic resonators have different characteristics and may require experimentation to provide adequate coverage. Aim for 7.050 - 7.150 MHz and accept anything more than this as a bonus. However if the range extends down into the CW portion, a smaller variable capacitor is

helpful to cover the phone section only and allow easier netting. Experiment with the value of the 470pF capacitor if coverage is still unsatisfactory.

The audio amplifier can then be constructed next. This is a very conventional circuit about which little need be said. However as audio was insufficient (even with a capacitor across pins 1 and 8) with the LM386 on its own, a simple preamplifier was added. As with the RF oscillator and doubler stages, the parts were mounted on blank matrix board.

The power balanced modulator is constructed on a blank printed circuit board screwed to the inside of the case. Pads made of PC board offcuts are glued to the PC board groundplane to provide anchor points for non-earthed

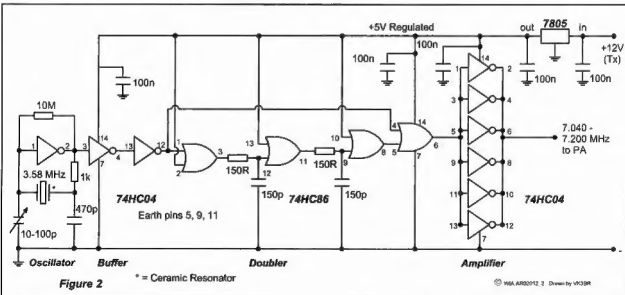


Figure 2: Schematic diagram of oscillator/doubler/amplifier

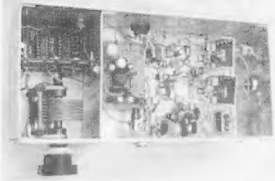


Photo 2: Inside NoPA

components. An effort was made to make construction as symmetrical as possible. U-shaped heatsinks of 2x3 centimetres were screwed to each transistor. However if you like long overs, larger heatsinks would be desirable. Also on this board is the pin-network and transmit/receive relay.

## Testing and Adjustment

The main items needed to adjust the NoPA are a 7 MHz SSB communications receiver and RF power meter/dummy load. After verifying the operation of the oscillator/doubler/amplifier stage (use the communications receiver and RF probe), test the microphone amplifier by wiring a speaker in place of the 8 ohm transformer winding.

Once these stages have been verified, start to test the balanced modulator. Set the 10k trimpot near minimum position (wiper near earth end), and find yourself on the receiver. Disable the receiver's noise blanker and back off the RF gain

control. Wear headphones to prevent feedback. Your signal should sound clean on both upper and lower sideband. The needle on the RF wattmeter should quiver slightly.

While speaking, gradually adjust the balanced modulator bias control so that the applied voltage increases. The power output on voice peaks should rise. Cease speaking and watch the power indicated drop to a low level. Further advancement of the bias control will result in significant power being indicated even with no speech. The IRF510s will also be getting rather hot at this point. Back off the bias control so that quiescent output is low. Monitor the signal on the receiver again to ensure it sounds clean.

## Operation

Operating the station requires that the transmitter and receiver be brought to the same frequency. This can be done by adjusting the VXO until the carrier (which should be considerably weaker than the sidebands) is zero beat on the receiver.

Speaking into the microphone should result in a signal that is on the same frequency to which the receiver is tuned. Operating is otherwise similar to using any other PTT-controlled station.

However, as no receiver muting is provided, headphones should be worn during transmit to prevent audio feedback.

## On the air

The author has found that the minimum power for clear reliable communications on 40 metres is approximately 5 watts DSB (or 2.5 W SSB). At this power level readability five reports are the rule rather than the exception for distances up to about 1000 kilometres. The use of ordinary wire antennas is assumed.

The proportion of readability 5 reports received falls steeply once power is reduced. At the one watt level only about a third of stations contacted give a readability 5 report. Many of those that do are using better than average antennas and/or operate from a quiet location. Distance is also important – receiving stations closer than 100 or further than 800 kilometres lose readability quicker than those 400 to 600 kilometres away, which is the optimum distance for 7 MHz during the day.

At the NoPA's one-watt power level, each contact is a thrill and Q5 reports cannot be expected every time. Nevertheless, unassisted contacts to VK1, 2, 3 and 5 have been made with the transmitter described. Stations contacted have reported good quality audio and no discernible carrier.

## Ideas for improvement

It is not claimed that this rig is the best that can be constructed using this technique. The following are some suggestions for improvement:

- Increased RF power output. Applying 24 volts to run the balanced modulator boosts output to approximately three watts. If 12 volt operation is desired, other transistors (not necessarily FETs) could be substituted for the IRF510s.
- Addition of a direct conversion receiver. Apart from obviating the need for a separate receiver, this modification assists frequency stability by running the ceramic resonator oscillator continuously. If the aim is to produce the simplest possible design, use could be made of the microphone amplifier stage in the receiver.

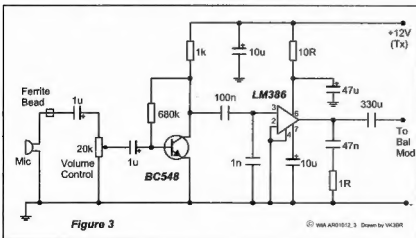


Figure 3

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Figure 3: Schematic diagram of microphone amplifier



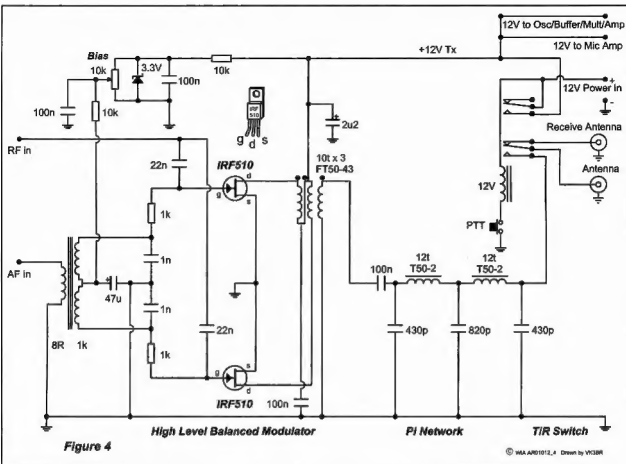


Figure 4: Schematic diagram of balanced modulator/LPF/T-R switch

- Use on other bands. Switching out the doubler could allow operation on a section of eighty metres or, if a 1.843 MHz crystal is substituted, 160 metres. The only other change required would be in the pi-network.

## Conclusion

A simple double sideband transmitter of novel design has been presented. As well as being an interesting project in its own right it revives a technique that has much application in other simple transmitter and DSB converter designs.

## References

- (1) Williams, *Lo-Key* September 1998, p4
- (2) Sillet, *Amateur Radio Action* Vol 4 No 11, p29

✉

## Over to you

### Circuit Board Manufacture

I have tried a number of methods of home-brew construction including 'dead-bug' and veroboard. Notwithstanding the attributes of these methods, I much prefer using circuit boards printed especially for the task.

But, how to do the artwork? I remember the 'rub-on' circuit board patterns available through the Tandy organisation some years ago, unfortunately impossible to obtain nowadays. They were great for those on-off jobs.

I have tried to use a PC programme of the type that is readily available on the web, but am totally confused by the incredibly involved procedures one has to follow to try and produce a piece of artwork for a simple project. No doubt they are good, but one has to be a constant (probably daily) user to be able to keep-in-touch with the procedures involved.

Does anyone know of a simple system for PCB artwork involving only single-sided work, that is simple to follow. I

believe such a programme would be very popular with home-brewers. I envisage a simple system with a 'library' of lines of assorted widths, IC and transistor sockets/pads, that can be dragged wherever needed etc. Perhaps the ability to invert the finished artwork, as required for negative-resist boards, could also be included.

Any ideas anyone?

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## Cocky-proof those antennae!

Bernie McIvor VK4EJ

One of Australia's most endearing group of birds whether it be The Sulphur Crested Cockatoo, the Corella or even the humble Galah, can wreak havoc and have the most environmentally conscious amateur reaching for a shotgun when he finds pieces of black plastic lying on the lawn under his precious antennas. In this article I will try to give you a few tips and maybe save you a few bucks along the way.

In any other country other than Australia the above title appears very peculiar indeed even laughable. But for us Aussies who have had to replace a \$50 run of RG-213 cable or tracked down a break in our rotor cable 10 metres in the air, it is far from funny.

Over the past 20 odd years I have tried everything to make my antennas less inviting to the hordes of Cockies that visit. Living in suburbia, firearms are out, and besides it's a \$2000 fine for ending the life of one of our feathered friends. Rapping on the tower with a shifting spanner works fine if you can spare the time. But I have come up with a few solutions and would invite readers to come up with a few more.

Firstly, I believe protection is the best method of saving damage to antennas and feed lines and any other plastic

material incorporated in antenna design. You are fighting a losing battle trying to scare them away. By protection I mean an actual physical barrier between the expensive bits and their destructive beaks.

Starting with feed lines. I find the best

**Living in suburbia, firearms are out, and besides it's a \$2000 fine for ending the life of one of our feathered friends. Rapping on the tower with a shifting spanner works fine if you can spare the time.**

and most cost effective method is to run the entire length of the exposed cable through Plastic Polytube. This Polytube is inexpensive and can be purchased at any hardware or chain store. I use the Irrigation type used for micro irrigation systems. A 30-metre length can be purchased for around \$4 and it is lightweight and is thick enough

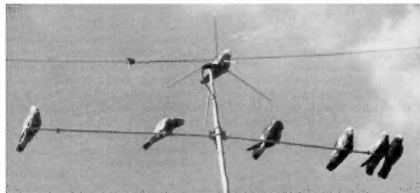
to stop penetration into the outer coating of your coax cable. As well as covering RG-213, I have used it to cover the 300-ohm ladder line in G5RVs. It does however alter the electrical length, but this is a small inconvenience.

It actually has a few benefits. It stops

rain and dew altering the tune up qualities and makes a more stable antenna. I also run my rotor cable inside Polytube as it is designed for outside use and incorporates UV protection. It is very flexible, unlike electricians conduit and is easily fixed to the tower or mast with cable ties. Remembering to always use black cable ties for outside use. I have found that the ties the hardware stores sell for use in holding shade cloth are reasonably priced, and very serviceable.

I am compelled to make a note on Safety regarding cable ties. ALWAYS trim them off flush with the head of the ratchet mechanism. If you leave a small tail, in time it hardens in the sun and becomes very sharp. I have cut the webbing between my index finger and thumb a few times so have learnt the hard way.

I have used two methods of incorporating Polytube. The first is to slide the entire length inside before soldering the PL-259 on the ends. This



The culprits

is the ideal method, however if the antenna and cable are already in service, you can split the whole length of polytube and work the coax inside starting at one end. The tubing reforms around the coax and can be taped up every 40 cm or so with black electrical tape or use cable ties. The only problem encountered here is when sharp bends in the routing of the run. Closer taping usually fixes this problem. I have found black tape to be superior, remembering that you don't want to draw attention to it and cockys are attracted to coloured tape. Red and yellow in particular. Blue is second best.

With feed lines covered, the next item on the agenda is the antenna itself. Be it a homemade dipole or an expensive imported array, all are subject to attack. With dipoles, I have found that I have more problems with the support ropes than the wire itself. I use plastic coated household earth wire for dipoles and I know this will make the purists shudder.

But after a month or so in the air it stops stretching and can be quite a useful antenna for the low bands. I can put up with the chew marks in the plastic coating as it makes little difference to the overall performance. But finding your wire lying on the ground just before a major contest can be disheartening.

I have found that Dacron rope is far superior to anything else. I have tried all thicknesses of nylon and hemp and it just does not go the distance. Dacron, normally being green in colour does not seem to be of interest to cocky's.

Most antennas I have tried here have all been subject to damage by birds. I had a 2 element cubical quad for 10 and 15 metres and the sheer weight of the birds collapsed it. They won that round due to my flimsy design.

I have since stuck with multi band trapped yagi antennas due to space and budget restrictions as they seem to withstand more punishment. This said, they need modification before they can be erected. I have been off air for long periods awaiting new plastic trap ends. I don't believe that manufacturers even consider cockatoo attack when designing antennas, even Aussie companies. I guess I am in the minority. It is my opinion that if possible, purchases an antenna without traps and with the least amount of plastic or nylon parts.

The first thing that you find under an



Too many, too often



Trap end damage

unprotected antenna is the plastic end caps. They usually just push on with the intent of keeping out moisture. Cockatoos take delight in removing them. I have replaced them with plastic and rubber chair tips and all end up on the lawn. I now just remove them altogether. Instead, I fill the end of the elements with a good quality silicone. Push the applicator nozzle up the end of the element tubing as far as it will go and withdraw it as you fill to the end. Fill them flush with the end of each element. The cockies pick at it, but never seem to remove the whole plug.

The next thing is the plastic trap end caps, I have mullied over a lot of ideas for a solution.

Needing to cover the existing caps I thought of all sorts of ways but settled on PVC electrical conduit. I purchased a length of pipe slightly smaller than the diameter of the trap.

I was careful to buy the grey exterior type as the orange PVC pipe, although slightly thicker is designed to be buried underground and has no UV protection. It discolours quickly and becomes brittle in no time.

I cut the pipe into lengths just slightly longer than the plastic end cap about 30mm long, then made another cut lengthwise on the seam of the PVC. This makes a type of clip to slip over the end of the trap. I then clamped the clip using the above mentioned cable ties onto the

end caps. It looks quite neat and tidy and is light and tough. I made sure that the locking mechanism on the ties were facing downwards to make it more difficult to be picked at. It seems to work well and all the bits and pieces are readily available.

Finally, my beam has a balun as a matching system. When it arrives in the box it is covered in a few layers of electrical tape and that is all. One glance will tell you this is inadequate. I purchased a half-metre length of thick compressor hose and cut a series of vees in it to enable it to be bent around the balun. I affixed it solidly with cable ties and covered the connecting wires with thin plastic tubing of the kind used as risers for garden irrigation.

This seems a lot of work I know, but well worth the effort if you have cockatoos in your area. Not only does the above system keep the cockatoos from ruining your investment, but also gives a degree of solar protection. Your coax cable will last a whole lot longer being protected from the Aussie sun. I hope these ideas help.

If anyone else has any other tried and true methods of cockatoo protection, I would love to hear from them, either QTHR or Email me at vk4ej@qldnet.com.au I am always open for suggestions.

73 Bernie VK4EJ.



# Spotlight on SWLing

Robin Harwood VK7RH

With little respite from continuing strife and wars, Africa is the most dangerous place to be. Ethiopia and Eritrea, near the Horn of Africa, once part of the same colonial nation have fought a long battle to assert territorial sovereignty. The UN brokered a tenuous truce. Several political opposition groups in both nations, operate clandestine broadcasting stations, mainly from European commercial senders, such as Deutsche Telekom, broadcasting back into the region. Low powered portable stations have also been heard.

The Democratic Republic of the Congo, formerly known as Zaïre, has been at civil war since its independence from Belgium in 1960, with strife from its neighbours spilling into it.

Messy tribal conflicts in Uganda,

Rwanda and Burundi caused ethnic cleansing on a massive scale, making the DRC ungovernable. Clandestine broadcasting especially hate radio flourishes in such an environment. To counter this, the UN, and with private foundations established Okapi Radio, from Kinshasha, the capital. With no suitable HF facilities, I believe that they used Africa No.1 in Gabon as a temporary measure.

Neighbouring Zimbabwe is unstable, verging on civil war. Expatriates have created a clandestine station in London via the Madagascar relay of Radio Netherlands. Recent monitoring suggests that they may now transmitting via an unidentified African nation.

West Africa has civil wars in practically every nation except Ghana.

Liberia is a nation in name only and the protagonists have spilled over into supporting violent ethnic warfare in Sierra Leone, Senegal, The Gambia, The Ivory Coast, Burkina Faso Togo and recently Mauritania. *High Adventure Ministries* have operated shortwave stations from many sites and planned to establish a sender in Liberia. With a transmitter purchased from FEBA in Seychelles, H.A.M. abandoned their plans when Liberian warlords attacked Monrovia. This forced the evacuation of all personnel; claimed to be to Uganda.

To follow developments in this murky radio war, I recommend *"Clandestine Radio Watch"* edited by Martin Schoech in Germany. They have a moderated list on Yahoo groups plus a website at [www.clandestineradio.com](http://www.clandestineradio.com)

## HCJB in Quito ceased English language broadcasts to Europe and North America on May 31.

This is the schedule for their remaining broadcasts on shortwave as from June 1<sup>st</sup>.

UTC	UTC	Freq	kW	Deg.	Target	UTC	UTC	Freq	kW	Deg.	Target
<b>English</b>											
1100	1330	15115	100	35Z/128	N/S America	0830	1400	6080	8	90 (Vert.)	S. America
1100	1330	21455	1	35/225	Eur/S. Pacific	2100	0300	3220	8	90 (Vert.)	S. America
<b>German (High)</b>						2100	0300	6080	8	90 (Vert.)	S. America
0500	0530	9780	100	42	Europe	2130	0000	9745	100	155	S. America
0500	0530	21455	1	35/225	Eur/S. Pacific	<b>Russian</b>					
0930	1000	6010	100	155	S. America	0330	0430	11885	100	34	W. Russia
0930	1000	21455	1	35/225	Eur/S. Pacific	<b>Spanish</b>					
2000	2030	15545	100	42	Europe	0100	0500	9525	100	325	Mexico* (or 9745)
2000	2030	17795	100	38	Europe	0600	0630	9655	100	42	Europe
2000	2030	21455	1	35/225	Eur/S. Pacific	1030	1100	21455	1	35/225	Eur/S. Pacific
2300	2400	11980	100	131	S. America	1030	0500	690	50	000/180	Ecuador
<b>German (Low)</b>						1100	0500	6050	50	18/172	S. America
0530	0600	9780	100	42	Europe	1100	1300	11980	100	355	Cuba
0530	0600	21455	1	35/225	Eur/S. Pacific	1100	1500	15140	100	150	S. America
1000	1030	6010	100	155	S. America	1300	1500	11980	100	323	Mexico
1000	1030	21455	1	35/225	Eur/S. Pacific	1430	1530	21455	1	35/225	Eur/S. Pacific
2230	2300	11980	100	150/330	N/S America	2030	2130	15545	100	50	Europe
<b>Huarani</b>						2100	2300	15140	100	150	S. America
1030	1100	6050	50	18/172	S. America	2030	2400	21455	1	35/225	Eur/S. Pacific
<b>Portuguese</b>						2300	0100	15140	100	160/330	N/S America
0800	0930	9745	100	100	N. Brazil	HCJB's SW schedule also includes these programs.					
0800	0930	21455	1	35/225	Eur/S. Pacific	<b>Arabic</b>					
1530	1600	15295	100	139	Brazil	2100	2230	12025	250	150	N Africa U.K.
2300	0230	11620	100	126	Brazil	<b>English</b>					
0000	0230	12020	100	100	Brazil	0700	1200	11770	50	120	Stp Pac Aus.
<b>Quichua</b>						1230	1730	15480	75	307	India Aus.
0830	1000	6125	100	155	S. America	<b>Russian &amp; Central Asian Languages</b>					
0830	1030	690	50	000/180	Ecuador	1600	1700	11760	500	62	Cent Asia U.K.
0830	1400	3220	8	90 (Vert.)	S. America						

HCJB is continuing English broadcasts at 1100 primarily for the benefit of missionaries within Central and South America, but with regularly scheduled sponsored programs. I believe that the German programs will cease in October.

Transmissions from the HCJB Australia site have been plagued with interference from co channel stations

ever since they commenced in January. Latest is another evangelical broadcaster WYFR in Okeechobee, Florida also on 11770. Although the Kununurra sender has been increased to 50 kW on its South Pacific release, severe interference has been noted in NZ from WYFR.

It was announced that the popular program, "DX Partyline" shall be

continuing on Saturdays from their Australian site at 0930 and perhaps from Pilo on 15115 at 1230. There also has been a report that this program may be relayed from an American station.

Well that is all for this month. Don't forget you can email your comments to me at [VK7RH@wia.org.au](mailto:VK7RH@wia.org.au)

73 Robin ar

# Using Crystal Oscillator Modules

Peter O'Connell VK2EMU

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A recent article in AR (reference 1) described various uses for junked computer crystals. As well as discrete crystals, old computers are a wonderful source of crystal oscillator modules.

One of the significant advances in radio was the development of the quartz crystal for frequency stabilization. For many decades oscillators were built using discrete quartz crystals. In the 1980s a complete crystal oscillator, built into a single DIL (Dual In-Line) package, was developed for use in personal computers.

Many uses can be found in amateur radio and electronics for these crystal oscillator modules which only need to be connected to a 5 volt power supply to make them oscillate! They are available in a wide range of frequencies from 1 MHz to 125 MHz. Generally their accuracy is  $\sim 100$  parts per million, thus a 10 MHz module has an accuracy of  $\pm 1$  kHz.

These modules have two disadvantages. One is that they are available only at those frequencies as used in computers. Various integer frequencies, such as 8 MHz, 10 MHz and 12 MHz, are obtainable, there are also some modules with apparently strange frequencies such as 1.8432 MHz (which is  $1024 \times 1800$  Hz). The other disadvantage with the modules is that it is not possible to fine tune their frequency. When using a discrete crystal in an oscillator fine tuning can be achieved by adding a trim capacitor or trim inductor in series (or parallel) with the crystal. To counteract the disadvantages, oscillator modules have the advantage of being stable crystal RF source that is easy to implement.

The most common modules are in a DIL 14 metal can, some are also available in DIL 8 packages. Unlike the normal DIL 14 package, the module cans have only four pins (1, 7, 8 and 14). As with the DIL 14 packages, used for 74xx TTL, or 40xx CMOS, digital ICs, the ground and voltage connections are pins 7 and 14 respectively. The output is at pin 8. On most crystal oscillator modules pin 1 is not connected but some use pin 1 as enable/disable. If a module does not oscillate then try connecting pin 1 to ground or to 5 volts.

## Uses for Crystal Oscillator Modules.

Many uses have been found for these modules. Drew Diamond VK3XU has used these modules in a number of his projects (references 2, 3 & 4). A module of 1.8432 MHz frequency could be used as a signal source for receiver testing on 160 metres, whilst a module of 28.322 MHz frequency could be used for a similar purpose on 10 metres. Binary division of the frequency of a 28.322 MHz module gives frequencies of 14.161 MHz, 7.0805 MHz and 3.54025 MHz that can be used to test a receiver on 20, 40 and 80 metres. Modules are also available at 14.31818 MHz and 3.6864 MHz. The modules can also be used as the basis of a simple CW, AM or DSB receiver.

In older editions of the ARRL Handbook discrete crystal oscillators with a frequency of 3.5 MHz were featured and this frequency was then multiplied to frequencies of 7, 14, 21 or 28 MHz for a multi-band transmitter. To obtain these higher frequencies it is necessary to use frequency multipliers and appropriate tuned circuits. Frequency division is much easier simply by using a single low cost integrated circuit.

There are several types of divider ICs that can be used with crystal oscillator modules. The standard 4xxx CMOS chips will work up to several MHz, but higher frequencies generally require higher voltages. The 74HCxx ICs are much faster than standard CMOS ICs. The standard 4040 chip is rated at 10 MHz (at 5 volts) and the 74HC4040 is rated at 90 MHz typical. The 4040 and 74HC4040 ICs are 12 stage binary dividers; by using either of these it is

possible to produce frequencies of 16 MHz, 8 MHz, 4 MHz, 2 MHz, 1 MHz etc., (all the way down to 7.8125 kHz), using a 32 MHz module.

If it is necessary to divide a frequency by 10 this can be achieved by using the 74HC390 (rated to about 30 MHz), or the 4017 (rated to 5.8 MHz at 5 volts). The CMOS 4017 is a Johnson counter and can be configured to divide by any number from 2 to 10. Using a 32 MHz module with a 74HC4040 and a number of 4017s, frequencies of 1 MHz, 100 kHz, 10 kHz, 1 kHz, 100 Hz, 10 Hz and 1 Hz can easily be obtained. 74HC4040 divider chips are not readily available at the main street electronics shops (Dick Smith Electronics or Jaycar), but are available from specialist suppliers such as Farnell & RS Components. To divide by 2 (or 4) a 74HC74 available from Dick Smith Electronics or Jaycar can be used. If you are prepared to use three easy to get 74HC74 instead of one hard to get 74HC4040, then a 32 MHz module can be divided down to 1 MHz.

A current project I am building requires a 1 Hz clock pulse. With a number of options, I settled on a 24.576 MHz module. The oscillator was divided by 4096 using a 74HC4040 to give 6000Hz. This was then divided by a series of 4017 to give 1Hz.

A crystal oscillator module can also be used to provide a square wave of known frequency to use with a CRO for comparison with a waveform of unknown frequency. These modules can also be useful in testing a digital frequency counter. One more thing to remember when using crystal oscillator modules is that they do not have a symmetrical square wave form output. Depending on the device, they may be around 40/60 or 45/55.

*continued next page*

# Another use for ex-computer crystals

Steve Mahoney VK5AIM

Just recently I believe I had a faulty 80/40 m dipole antenna. The dipole is fed with 400 ohm open wire line. That "Dog Bone" style of feeder, now as extinct as the dinosaurs! The conductor in this feeder is solid copper wire, about 16 swg. Checks revealed no broken conductors, I even reterminated the junction of the inner dipole ends of the 400 ohm feeder, it was a bit corroded, but to no avail.

The fault showed itself up as an intermittent drop in received signal and noise. If it was a real "Kellogg" night, i.e. Snap, Crackle and Pop, like 80 m can be, it was difficult to notice. If you go to transmit and then come back to receive, it's gone! The VSWR on transmit was OK. It was as if the RF current was enough to clean/burnout the bad connection.

I needed a constant signal, arriving through the antenna system to enable me to, move, shake etc the antenna system to try and establish where the fault might be. Where do you get a constant signal of reasonable strength on 80 m during the day? When you can see what is going on.

Ha, I thought, use the Crystal Checker unit I made to check those ex-computer crystals. With a 3.575 MHz crystal plugged in, 1/2 a metre of hookup wire as an antenna and a rubber band, to hold the push button on switch ON, the signal was 7-8 on the transceiver in the shack. I hung it up in a fruit tree in the back yard. Inside it was still a good 7-8 on the receiver. With the speaker lead extended and sitting in the open shack window, I proceeded to shake and

wobble all the antenna connections.

I undid the shack ends of the 400 ohm line and cleaned the bare ends, they were tarnished, cleaned them with one of those Green Kitchen Scouring pads, till bright and shiny. NO it was still there some times, you could hear the signal jump, with added crackle. I suspected an expensive co-axial switch used to select antennas. Cleaned the contacts in the time honored relay contact cleaning method with strips of paper. No, that was not it. I even bypassed the co-axial switch and the ATU. It's still there. I still haven't found the fault. With 80 m as noisy as it is during summer, I decided to wait until winter and a shower of water washes it away!

However some time later I decided to check the conductors of the dipole for breaks. The dipole conductors were 7 strands of hard drawn bare copper, with a black plastic insulation. I believe it was intended for antennas. On disconnecting the 400 ohm feeder at the dipole center I saw that the strands of copper conductor were all oxidized, that dark chocolate colour. I cut it back in small increments until I had gone back about 6 inches and it was still oxidized. Both

sides of the dipole were the same. On checking the outer ends of the dipole, they were the same. Was the whole length of the conductor oxidized? The electrical theory says that copper oxide is a semiconductor!

Did I have a "Long Diode" as an Antenna? The only way to prove it was to replace the dipole with new wire. I raided the wire stocks and found a reel of 18 swg enameled copper wire I had obtained from an old transformer. Stretching it out to remove the kinks and measuring off the length for an 80 m dipole I used the old wire to draw the new wire in place over trees and buildings. Reconnecting the feeder to the new dipole I could hear the signal from the little crystal oscillator, loud and clear. Back down in the shack the antenna tuned up with the ATU, a little different in settings, but with a VSWR reading of almost zero. Later that evening on an 80 m net all signals were OK, no snap, crackle and pop. All the net contacts gave good signal reports.

The Crystal Oscillator was a great help as a signal to monitor. I can recommend it.

## Using Crystal Oscillator Modules *continued from previous page*

### Sources of Crystal Oscillator Modules

There are two methods of obtaining crystal oscillator modules. The first is to pay good money to a supplier. Farnell and RS Components list them at a cost of about \$12 each (+ GST) and some other suppliers also carry a limited range. The other is to salvage them from old computer boards as I have done.

Recently I purchased a '386' motherboard from David Reid Electronics (York Street, Sydney) for \$5 which yielded four modules with frequencies of 1 8432 MHz, 16 MHz, 30

MHz and 40 MHz. Over the last couple of years, I have salvaged modules of many different frequencies from old computer boards.

These boards are often available at ham fests or as complete computers dumped on the side of the road on cleanup campaigns. Over the last couple of years, I have salvaged oscillator modules of many different frequencies, including 37 732 MHz, 44.5 MHz and 32 MHz.

In conclusion if you have not played with these interesting little devices, then it is high time that you did so!

### References

1. *Junked crystals make a tree-top tester* Steve Mahoney VK5AIM AR April 2002
2. *Receiving Converter for 2 metres.* Drew Diamond VK3XU AR September 1995
3. *Receiving Converter for 6 metres* Drew Diamond VK3XU AR October 1996 & "Radio Projects for the Amateur" Vol 2
4. *"Nano-L" inductance bridge for small coils* Drew Diamond VK3XU AR May 1997 & Radio Projects for the Amateur Vol 2

# What's all this Linux business?

By Peter Barrett VK6PEC

If you are a regular computer user, you have no doubt by now heard of Linux. Perhaps you have noticed that many amateur operating modes such as packet, irfp and aprs are now using Linux in a big way. Perhaps you have seen books, magazine articles and websites extolling it's virtues and thought about having a go. Perhaps like me you have "taken the plunge" and put a distribution or two on one of your hard drive partitions with varying success. This article aims to give you a better perspective of exactly what the Linux phenomenon is, and hopefully dispel some of the myths surrounding it.

## Exactly what is Linux?

Linux itself is a single computer program. It is a special type of program called an Operating System, usually abbreviated to OS. This is a special type of computer program that takes control of all your hardware, usually when you start your machine, and makes it all available for you to use as you like. OSs are of course exactly as old as computers themselves and are usually precisely as big and as complicated as the hardware they need to control. Microsoft is the biggest producer of operating systems and its MSDOS and Windows OSs have made it one of the most successful companies in the world. But remember that although the Windows system you install seems to be huge and takes a long time to load, the operating system itself is a single small program that easily fits on a floppy disk. This is also called the Kernel, or core of the system. Linux works the same. A whole subculture has been built around this single program.

The story of Bill Gates and how he bought and cobbled his original QDOS system into a commercial bonanza is now computer folklore, as is the story of Linus Torvalds, a Finnish student who took another existing operating system and adapted it for his own needs, published it on the web and captured the imagination of a whole band of up-and-coming programmers dreaming of a public-access development system.

## Is it true that...?

Like anything new and different, many myths and misconceptions enter the discussion whenever the subject of Linux comes up. Let's have a look at some:

### 1. Linux is fiddly

**True.** You should expect to spend a LOT more time fiddling about with a Linux system to get it to run exactly how you want it. I consider this to be a plus. I became a Radio Amateur because I like fiddling about with stuff.

### 2. Linux can do anything Windows can

**False.** Every hardware manufacturer supplies Microsoft drivers, and most of the big software companies know that just about everyone has Windows at home. Linus announced his new operating system to the world with this quote: "Remember the days... when men were men, and wrote their own device drivers?"

Having said that, Linux supports every type of application and hardware a radio amateur would ever need, including rig control, sound card decoders, antenna steering and design, logs and astronomy.

### 3. Linux is very stable

**True.** Providing you stick to thoroughly tested releases rather than the very latest "bleeding edge" experimental stuff, then Linux is an industrial strength brick dunny. Viruses are virtually unknown. Bugs and security problems are fixed within hours of being reported. This is why Linux is so heavily favoured for single-use machines like servers and BBSs. Its already been tested to destruction by expert hackers and professional vandals. It is particularly useful for recycling old machines into packet terminals, gateways, controllers and all those jobs where you leave a machine running unattended for months at a time.

### 4. Linux is only for programmers and boffins

**False.** Most of the big Linux builders like Red Hat, Debian and Mandrake supply a complete desktop system out of the box with very slick and easy to follow installers, and most good applications are now available as pre-compiled binaries where all the hard work has already been done. That said, the very nature of this system, which has basically been home-brewed by a world-wide network of enthusiastic volunteers, encourages you to learn more about your machine and how to take complete control of it so that you too can get involved.

### 5. Linux is hard to learn

**False.** While it is true that Linux works very differently to Windows, it comes with more documentation than you could ever read in a lifetime. The hardest thing to learn is where it all is. Once you've found it you will revel in it. There are also numerous mailing lists like "linux-newbie" and "linux-hams" where there are always patient people ready to help with any question no matter how trivial.

## Why bother?

So, having established that Linux is fiddly, is not as functional as Windows, needs to be relearned and is really better suited to single use industrial type things, you are entitled to ask: Why would I bother when I'm already on to a good thing? Well the answer is, what do you like to get out of the hobby of amateur radio?

Amateur radio is a very diverse hobby. At one extreme are the operating addicts, those who enjoy the thrill of the chase and simply buy their gear so that it can

*continued next page*

# 5<sup>th</sup> Region 3 ARDF Championships Ballarat

VK3WWW Jack Bramham

Some of you will be aware that the 5<sup>th</sup> Region 3 ARDF Championships will take place in Ballarat Victoria between November 28th - December 5th 2003, this is the second time that the WIA has been able to host these Regional Championships. Our last chance was in 1996, this event was held in Townsville and was attended by 58 competitors from about 8 international radio societies.

For the 5<sup>th</sup> Region 3 Championships we are expecting a similar numbers to attend. Each society can send up to 2 teams for each age category, our aim is to have as many VK competitors as possible so if you are a WIA member with time to attend the championships you then qualify for selection.

Competition is broken up into age categories, this event will follow International ARDF rules, under those rules the categories are: Junior: Under 19, Open: all ages, Old Timer: Women over 35 Men Over 40, Veteran: Men and Women Over 50, Seniors: Men and Women over 60.

There are 5 transmitters located on the course and competitors try to locate as many as possible in the shortest possible time. Junior competitors, Old Timers and Veteran competitors are only required to locate a maximum of 4 transmitters where the Seniors have a maximum of 3. Society teams are made up from 3 competitors in each age



Bruce VK3TJN en route to his first ARDF transmitter, Ballarat 2002.

Photo by Jack VK3WWW

category, after competition the two best scores from each team are averaged. The winning team is determined by the shortest average time and the most transmitters located.

With assistance from WIA Victoria, the Ballarat Amateur Radio Group and members of the Victorian ARDF Group we plan to make this a premier WIA event, if you are interested in either becoming a competitor or assisting as a volunteer please contact myself

VK3WWW Jack Bramham either by email: vk3www@alphalink.com.au or I am QTHR in the callbook

If you would like more information regarding ARDF and the Championships probably the best place to start would be [www.ardf.org.au](http://www.ardf.org.au) here you will find plenty of ARDF information and details for the 5<sup>th</sup> Region 3 ARDF Championships.

## What's all this Linux business? continued

be 100% available. They never homebrew or repair their own gear as this deprives them of valuable time spent contesting, rag-chewing chasing that rare island etc etc.

At the other extreme are the tinkering addicts. You hardly ever hear them on the bands because their gear is constantly under construction or repair. If you hear them come up it will be because they are finally testing that epic project but they will soon be dissatisfied with it and have it on the bench again.

Most of us are more balanced than this and fall somewhere in between these two extremes. We can probably recognise though whether we lean more one way or the other.

You can probably see where I'm going here. Linux will not appeal to those who just want to get on with operating their equipment without looking much "under the hood". They will buy proprietary software and be impressed by all the pretty "eye candy" bells and whistles that make their operating experience so much more convenient. Nothing wrong with that.

Or maybe you like to know exactly how everything works. Perhaps you get your thrills from that moment when you throw the juice into that pile of wire and pickings from the bottom of the junk-box and it doesn't go phut. For you Linux will be computer heaven. You will be awestruck by the dedication and true

amateur spirit of the "Linux Community" where you can watch software being built and perfected before your very eyes. You will instantly feel at home with this international and widely scattered but closely knit co-operative of programmers who are also hams. And they don't bat an eyelid if you want to fool around with their handiwork! You will feel encouraged to get involved even though you still don't know an int from a bool. Linux is a state of mind that starts from that one program. I say give it a try but then you can guess which end of the ham scale I lean to.

Like we say - "Use The Source, Luke!"



# 12 to 28 Volt DC - DC Converter

Keith Gooley VK5QJ

Let's say you are considering building an HF amplifier using mosfets such as the one described by Drew Diamond (ref 1.) But it needs a 28 or 24 volt supply. You want to take the amplifier portable and run it from a 12 volt battery along with the other gear in your portable station. Alternatively you want to run your packet station with it's laptop computer from the portable 12 volt supply. Most of these devices need about 18 volts on the external DC input. This DC - DC converter will do the job of providing 50 watt or so of DC power for your amplifier or computer. The output voltage can be adjusted to provide the 18 volt required by many laptop and notebook computers. In addition, the output voltage can be reduced to generate a regulated supply for charging gel lead-acid batteries from an unregulated 12 volt vehicle supply.

It is not uncommon for power mosfets to operate at 24 volt or more in RF power amplifiers as they are readily made to handle the higher voltages and are more efficient than those operated at lower voltages. So to operate such an amplifier portable we need a source of 28 volt. This requires a boost converter and as the negative side of the input and output can be common, no transformer isolation is required. A mosfet switch is turned on and current is allowed to build up in a choke and when the mosfet is switched off, the energy stored in the choke is dumped into storage capacitors where the voltage builds up to the required

level. The switched on period of the mosfet is adjusted to keep the output voltage constant independent of the load current.

## Circuit description

Having briefly outlined the why and how, we turn to how the circuit actually works. Most of the work is done by the controller IC, U1 a UC3843. This chip was originally designed by Unitrode Corporation but is now made by a number of manufacturers and is quite cheap as a result (about \$1.50). It contains a fixed frequency oscillator, the frequency of which is controlled by R1

and C11. The values shown in the circuit result in a frequency of 45 kHz. The internal 5 volt reference is brought out on pin 8. Pins 1 and 2 are the output and input of the error amplifier. Pin 2 is the negative input of the amplifier. The positive input is taken internally to a 2.5 volt reference. The "totem pole" output stage of this chip (pin 6) has quite a high peak current capability of 1 amp which is required to drive the relatively high input capacitance of the mosfet.

The chip also contains a current sense comparator, input on pin 3. If the voltage on this input exceeds the error amplifier output, the on period of the circuit is

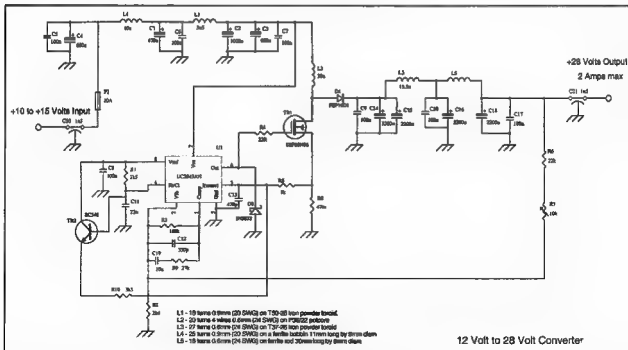


Figure 1. Circuit Diagram



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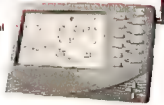
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terminated. This can be used as a cycle-by-cycle current limit. An under-voltage lockout circuit is included in the IC so that if the supply voltage is not sufficient to turn the MOSFET hard on the output stage remains off. The threshold for this circuit is 8.4 volt for this particular member of the UC384X family.

The input voltage to the converter is applied to the main energy storage choke, L2 as well as U1. At the beginning of each cycle, the MOSFET TR1 is switched on by U1 output going high. The drain current in TR1 rises in a linear ramp building up energy in the choke. The drain to source current in the MOSFET flows through the current sense resistor, R8 so that the source voltage is directly proportional to choke current. When the source voltage which is applied to the current sense input equals the error amplifier output, the controller output goes low, turning off the MOSFET.

Current flow in the choke L2 can't stop instantaneously, so the voltage on the MOSFET drain end of the choke rises until diode D1 conducts and the energy stored in the choke is passed to the filter capacitors and to the load. After an appropriate off period during which current in the choke ramps down again, the MOSFET is turned on and the cycle repeats. At high load currents, the current in the choke may ramp up and down never reaching zero. At light loads however, the choke current reaches zero some part of the way through the off period.

Resistors R6 and R7 feed the output voltage back to the error amplifier and the ratio of feedback resistor R3 and the sum of R6 and R7 determines the gain of the error amplifier. This has been set to a quite modest value of 7 in the interests of loop stability. C12, C19 and R9 tailor the frequency response of the

error amplifier to maintain stability consistent with good transient response.

There are several other components around the controller chip which deserve explanation. D2 is a schottky diode chosen for its low forward voltage drop. The voltage on the controller output pin can go negative due to switching transients being coupled to the MOSFET gate by internal capacitors in the MOSFET. If D2 were omitted, these negative transients could cause instability in the IC. R5 and C13 form a low pass filter to attenuate the spike of drain current in the MOSFET which occurs at the start of the on period caused by the choke winding capacitance. The time constant of the RC combination is about 0.5 msec. Transistor TR2 and R10 take a sample of the oscillator ramp voltage and feed it into the current sense input of the controller IC. This is referred to as "slope compensation" and it prevents the controller oscillating at sub harmonics of the main oscillator frequency (ref 2).

The remaining components in the converter are included for interference removal or Electromagnetic Compatibility (EMC). When designing this converter I was very conscious of

the fact that it would be used in conjunction with sensitive amateur receivers and without good EMC protection, interference is highly likely. 5 pole filters are used on the input and output of the converter. L4, L1 and the associated capacitors reduce to a low level switching transients conducted back along the battery lead and L3, L5 and the associated capacitors do likewise on the output lead. Most computer power supplies only have a 3 pole filter for EMC protection. The high value electrolytic capacitors have low effective series resistance (ESR) at low to medium frequencies, especially if switch mode power supply types are used. The 100 nF ceramic capacitors bypass the higher frequencies.

## Implementation

The converter is constructed on a home made double-sided PCB with a ground plane covering the component side of the board. It is housed in a diecast box giving good EMC shielding and robust protection desirable in a portable environment. If desired, though a non shielded plastic case could be used. Likewise, a single sided board could be used in place of the double sided PCB

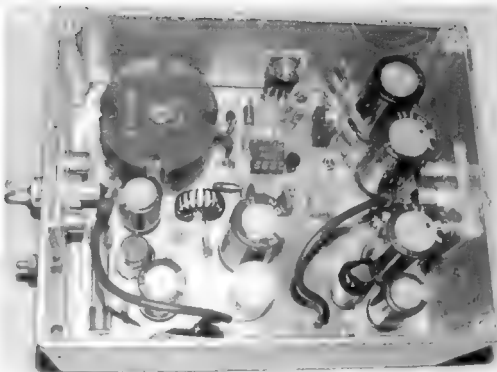


Photo 1. Inside view

It should have a ground plane on top and the connections made underneath with component leads and hookup wire. Use a copy of the PCB overlay as a drilling template (ref. 3). "Paddyboard" construction could also be used. It is important that short leads and good RF grounding practice be used particularly around the controller IC.

A double sided PCB without plated through holes or a silk screen overlay is available from the writer for \$25 including postage.

## Component Selection

Discarded computer power supplies provide a rich source of components for a project like this. Look for 16 or 25 volt working electrolytic capacitors on the +12 volt output part of the board. The capacitance isn't critical, 470 to 1000µF is typical. Electrolytics on the output side of the converter need to be 35 volts or more and these aren't common on computer power supply boards but if you can scrounge electrolytics from some other type of switchmode PS, they will most likely be low ESR types (Effective Series Resistance). These are desirable to keep the noise and ripple on the

output as low as possible. It isn't essential that low ESR types be used but there will be a rise in output ripple and noise if standard types are substituted. If the voltage is reduced, clearly the voltage rating of the output capacitors can be reduced accordingly.

The chokes, L1, L3, L4 and L5 can be removed from the computer PS boards. The actual value of inductance is not important. They are often wound on a ferrite bobbin or a length of ferrite rod and covered with insulation of some sort. Use the ones from the +5 and +12 volt outputs rather than from the negative outputs which are much lower current rated.

The potcore specified for L2 is available from RJ and US Imports who advertise in AR. A smaller potcore could be used. I tried a P26/16 (Altronics L5300 and L5305 bobbin) with a 2X 2.75 mm air-gap and a winding of 43 turns of 0.8 mm (21 SWG). The efficiency dropped from 87% to 81% and the potcore got warm to touch. However if this can be tolerated or a lower output power is desired then the smaller much cheaper core is a good option.

The MOSFET, TR1 came from DSE (#

Z1853). The peak current in this device is about 20 amp at full load, so be aware of the voltage drop across the drain-source resistance when the MOSFET is on. RDS(on) is a more important spec for a power MOSFET than current rating because usually RDS(on) determines the maximum current that can be passed by the device in practice. This is because voltage drop is more often the determining factor rather than maximum current. The SSP60N06 is a 60 amp device with an RDS(on) of 18 milliohm. I tried an IRF150 which is a 40 amp, 55 milliohm device in a TO3 package and the drop in efficiency was measurable though not significant (about 1%).

Resistor R8 is 47 milliohm. It needs to be about 2 watt. I used a ceramic case resistor. Alternatively, Farnell Cat # 327-4779 is a loop of wire of the correct resistance which can be soldered into the PCB. You could also put two 0.1 ohm resistors in parallel (DSE R1600). Diodes, D1 came from Farnell (298-825) and is a dual diode with the cathodes common. I connected the anodes together as well. I also tried a pair of diodes from a computer PS and the efficiency was only



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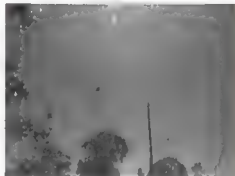
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slightly less. The diodes from the +12 volt section (yellow output wires) are the ones to look for. There are usually two wire leaded diodes with the cathodes soldered to a small heatsink. Use them with heatsink in place and the two diodes in parallel. D2 is a schottky chosen for its low forward voltage drop. Test the forward drop of diodes from a computer PS with the diode test range of a DMM. Look for one with a forward drop of less than 200 mV. Alternatively the specified 1N5822 is available from DSE (Z3252) and the much cheaper 1N5819 (Z3250) could possibly be used, but I haven't tried it.

The capacitors C11 and C19 should be plastic film types not ceramic. This is because C11 determines the oscillation frequency of the converter and C19 is a feedback compensation component. Both these applications require a low loss capacitor with good stability. Ceramic capacitors of the 10 or 22 nF value possess neither of these qualities. I used screw in through capacitors for input and output DC. The value is not important. The ones I used were reclaimed from a junked RF amplifier.

## Construction

Start by winding the coil on the potcore. You need 4 lengths of 0.6 mm (24 SWG) enamelled copper wire about 1.8 m long. Twist one end of the 4 wires together and hold it in a vice. Then holding the other end in a drill chuck twist the 4 wires together. Slip some sleeving over one end, about 25 mm will do, leaving enough wire protruding to make the connection on the board. Wind 20 turns of the 4 twisted wires finishing up opposite the start so that the start and end wires come out of the same aperture in the potcore. Put a couple of layers of tape over the winding to hold the end in place. Trim the wires to length and tin them ready for soldering into the circuit.

A total airgap of 2.5 mm is required in the magnetic circuit of the potcore, which means that the core halves must be separated by 1.25 mm. This is achieved by cutting out some discs of thin card sufficient to make a spacer of the required thickness. Use the potcore bobbin as a guide to draw discs of the correct diameter before cutting out the circles. Place the bobbin in position in one half of the core and put the discs on the core centre inside the bobbin. Place

the other core half over the bobbin and use the assembly as a drill guide to drill a hole in the discs for the mounting screw to pass through. Use a brass or nylon screw and do up the nut to the final tightness in order to check that the airgap is correct by measurement on the outside edge. If you have the means to measure the inductance, by all means do so. The exact value isn't critical, though.

Start the assembly by mounting the minor components on the board, resistors and small capacitors. The IC can be fitted into a socket if desired. Small heatsinks are required for D1 and TR1. I fixed TR1 to the side of the case with a "greaseless" insulator but if a plastic case is used a small TO-220 heatsink is necessary. It is advisable to delay the fitting of TR1 until it has been confirmed that U1 is working correctly. This is described in the section on testing.

Earth connections under the filter electrolytic capacitors are made using small tin plated eyelets soldered to the ground plane. In the absence of these eyelets the capacitors can be stood off the board and the lead soldered direct to the ground plane.

## Testing

Before applying power to the converter, do the usual checks of component polarities. It is easy for the experienced constructor to become blasé about these checks but they are still worthwhile and save a lot of angst if an electro has been put in back to front. As indicated in the construction section, leave out TR1 while doing the initial powered tests or alternatively lift one end of the MOSFET gate resistor, R4. Apply 12 to 14 volts from a preferably current limited supply. If all is well, the output voltage will be about 0.5 volt below the input and the current drawn will settle down to about 15 mA. If an oscilloscope is available, look at the waveform on pin 6 of U1. It should be rectangular with a frequency of about 45 kHz, an amplitude a little less than the supply voltage and a mark to space ratio of about 60%. That is, the positive section should be about 14 microsecond and the negative about 8 msec. If desired, you can test that the controller is working by applying a separate supply voltage, variable from 25 to 30 volt to the output. Depending on the setting of the trimpot R7, as you increase the voltage on the output the waveform on U1 pin 6 will collapse from

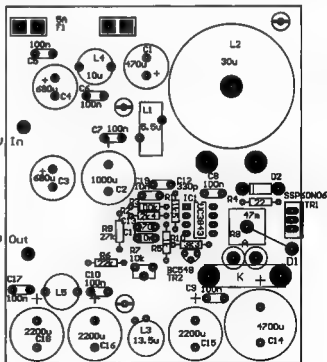


Fig 2 Component Layout on the Printed Circuit Board

60% M/S (mark/space) to a very short spike when the voltage passes through that set by R7. The frequency should remain at 45 kHz. You can then set R7 to give the required output voltage.

In the absence of an oscilloscope, the test can be done with a multimeter. The voltage on pin 6 should be about 7 volt average with 12 volt input and should drop to close to zero when the test with the variable power supply on the output is performed. The voltage on pin 8 should be 5.0 no matter what the chip is doing.

If all is well so far, TR1 can be powered up by connecting it into the circuit or re-connecting R4 as the case may be. Powering up the converter should result in a temporary audible buzz from the potcore as the output voltage quickly settles at the chosen value. Once this has occurred there should be no noise from the potcore. The converter can then be loaded down to its full rated output of 2 amp at 28 volt. The waveform on U1 pin 6 should be a nice steady 45 kHz with a M/S ratio, which increases with load current. Shorting the output should not result in anything more dramatic than the fuse blowing. This cannot be avoided in this architecture converter due to the direct DC connection from the converter input to output. The current in TR1 is limited by the current sense input of the controller, pin 3.

If an output voltage of between 12.5 and 22 is required, change R6 to 10k. The desired output voltage can then be selected by adjusting R7 as before.

## Conclusion

If you want a source of 15 to 30 volt from a nominal 12 volt supply to operate 28 volt amplifiers, laptop computers or charge gel batteries, this will do the job with an output power of 50 watt or more. The output voltage can be easily adjusted by changing one resistor. The efficiency is high, more than 85% has been measured so the unit gets barely warm to the touch.

## References

1. Diamond, D. VK3XU "25W MOSFET Linear Amp" Amateur Radio January 1991
2. Unistride Corporation. "UC3842/3/4/5 Provides Low-cost Current-mode Control" Application Note U-100A
3. Gooley, K. VK5OQ "A 10 MHz Crystal Reference Oscillator" Amateur Radio August 2001

## Parts List

(See text for discussion on parts substitution)

Capacitors	Qty	Designators
470µF electro	1	C1
1000µF electro	1	C2
680µF electro	2	C3, C4
100nF ceramic	7	C5, C6, C7, C8, C9, C10, C17
22nF plastic film	1	C11
330pF ceramic	1	C12
470pF ceramic	1	C13
4700µF electro	1	C14
2200µF electro	3	C15, C16, C18
10nF plastic film	2	C19
Feedthrough caps	2	C20, C21
<b>Chokes</b>		
5.5mH choke	1	L1
P36/22 potcore	1	L2
13.5mH choke	1	L3
10mH choke	1	L4
Choke (See text)	1	L5
<b>Resistors</b>		
1k5	1	R1
2k4	1	R2
100k	1	R3
22	1	R4
1k	1	R5
22k	1	R6
10k trimpot	1	R7
47mW (0.047 ohm)	1	R8
27k	1	R9
3k3	1	R10
<b>Semiconductors</b>		
SSP60N06	1	TR1
BC548	1	TR2
FEP16D1 diode	1	D1
Schottky diode	1	D2
UC3843	1	IC1
<b>Miscellaneous</b>		
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Circuit board	1	
Box	1	
Nuts and screws, wire etc		

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# New life for your old broadcast receiver

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## Listening pleasure past the top of the dial

Most people have one or more AM broadcast receivers not in use. These sets may be pocket radios, radio-cassette players or clock radios. Some cover AM only, while others offer shortwave and FM coverage.

This article describes how to convert almost any AM receiver to cover frequencies up to about 1.9 MHz. This allows reception of amateurs on 1.8 MHz and the growing number of narrowcast stations in the 1.6-1.7 MHz region.

### Choosing a receiver

The first step is to find a suitable receiver. This should be an older-style transistor set made between the 1960s and the 1990s. It must have analogue rather than digital tuning. If you don't already own one, these are readily available from weekend garage sales and swapmeets for a few dollars. In many cases the sets contain batteries, so they can be tested before purchase. Alternatively a relative or friend may have an old receiver for the asking.

The most suitable receivers have a long dial for easier tuning. Older sets often have a circular 'handspan' dial. In rare cases they also have vernier reduction drives, which make station selection easier. This is particularly

important at the top of the dial as stations tend to be closely spaced. A three gang variable capacitor indicates that the receiver has a tuned RF stage, which should aid sensitivity and image rejection.

If a choice of receivers is available, it is wise to compare sensitivity and selectivity. On a good receiver interstate stations will be heard between the locals at night. The 1.6 MHz narrowcast stations are a particularly good test as their power levels are quite low and are spaced every 9 kilohertz. Generally the older receivers provide better performance as AM is not the afterthought it is with the more modern AM/FM sets. Medium-sized and larger radios tend to provide greater sensitivity, tone and clarity than pocket sets.

It is possible that some receivers will not reach 1.8 MHz. However the author has yet to encounter one and reports a 100 per cent success rate with the receivers pictured.

### How superhets work and what the conversion does

AM broadcast receivers are usually single-conversion superheterodynes. The desired signal is converted to a 455 kHz intermediate frequency. The 455 kHz signal is converted to audio and fed to the speaker.

The frequency of the local oscillator and the resonant frequency of the front end both determine the received frequency. The use of a dual gang tuning

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| ● RG8/U Belden 9913F7 High Flex Low Loss                     | @ \$5.55 per metre |
| ● RG8/U - RF400 Belden 7810 Low Loss Sweep Tested to 6000MHz | @ \$6.30 per metre |



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| ● RG58: B80-006 UHF connector (M)    | @ \$7.65 each  |
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capacitor ensures that both these frequencies are separated by 455 kHz (the IF) at all points on the dial.

Standard AM receivers tune between 530 and 1600 kHz. To obtain this range, the local oscillator tunes 455 kHz above these frequencies, or 985 to 2055 kHz. To cover the popular part of 160 metres, the local oscillator needs to be extended to reach 2305 kHz. As will be explained later this is done by adjusting a trimmer capacitor or slug-tuned coil. The only other part of the conversion is to peak the front-end to ensure optimum sensitivity on 160 metres.

## Doing the conversion

Your aim is to extend your set's coverage to cover frequencies up to at least 1850 kHz. As with most modifications, there are trade-offs and in this case you will sacrifice sensitivity and coverage at the bottom end (starting at 600 kHz rather than 530 kHz). Dial calibration will also suffer. However even after the modification the set will still hear local broadcast stations.

Adjustments will need to be made with the case open and the receiver operating. For this reason, it is desirable to use batteries, even if it can also be mains powered. Where the set is mains powered only (such as with most clock radios) first check that there are no exposed contacts between the AC power lead and internal power transformer. If there are any exposed mains connections you have to insulate them out of harm's way while the set is open and being converted. Those with any doubt about what this entails should heed the advice on the set's back cover, 'No user-serviceable parts inside', and choose a safer battery-powered set to modify.

A 1.8 MHz signal source will be necessary to extract best performance from the modified receiver. This will either be an off-air signal (see next section for details of activity in your area) or something locally generated. Options include an HF transceiver transmitting 1.8 MHz into a dummy load, an RF signal generator, a crystal oscillator using a cheap 1.843 MHz crystal or the local oscillator from an unmodified AM broadcast receiver set to approximately 1.4 MHz.

The first step is to locate the receiver's tuning capacitor. If the set is less than about thirty years old, this will normally

be a white or clear plastic block about 3 centimetres square mounted on the main printed circuit board. Earlier receivers used a larger metal air spaced capacitor with two or three sections of vanes that move when the station is changed.

On the back or side of the variable capacitor will be two or more 'trimmer capacitors' with screwdriver slots approximately 3 mm long. The function of these is normally to align the receiver. However for this project we will adjust them to provide the extra coverage needed

Tune the receiver to a weakish signal



Photo 1. A selection of receivers, of varying size, converted to 160 metres.

near the top end of the broadcast band. With a flat-blade screwdriver or alignment tool screw one of the trimmers capacitors and listen to what happens to the signal.

If it gets slightly weaker, but remains properly tuned in, you have located the front end trimmer capacitor. This will be needed later in the conversion; make a mental note of its location or mark it with a blue felt tipped pen.

If adjusting the trimmer makes the signal disappear or changes the station, you have found the local oscillator trimmer. Mark this with a red spot.

If the trimmer does nothing, reset this

trimmer to its original position and leave it alone. If the set covers FM and/or shortwave, this trimmer will almost certainly be associated with these bands and is not relevant to the 160 metre conversion.

Repeat the process for all trimmers on the variable capacitor. When you've finished you will have identified the local oscillator trimmer (red) and the front-end trimmer (blue). Note that receivers with tuned RF stages may have two front-end trimmers instead of the normal one.

Expanding the receiver's coverage means adjusting the local oscillator trimmer capacitor to near its minimum capacitance position. This is where the plates do not overlap at all. Seeing a semicircle when looking at the trimmer indicates that it is set to full capacitance (i.e. plates fully overlap). If a three-quarter circle, the trimmer is set to half capacitance. A full circle means that it is set to minimum capacitance.

Because it is sometimes difficult to observe where the trimmer is set, the best plan is to again find a station near the top end of the broadcast band (the narrowcasters just above 1.6 MHz are ideal) and then tune the receiver slightly lower in frequency until the station almost disappears. Adjust the local oscillator trimmer until the station is again tuned in properly. Also listen for a peak in signal strength while adjusting the front-end trimmer.

Repeat these adjustments until coverage is obtained up to at least 1850 kHz. This is best checked with an RF signal generator, but the other methods described above to generate a 1.8 MHz signal can also be used.

If adjusting the local oscillator trimmer fails to sufficiently extend coverage, the set's local oscillator coil needs to be identified and adjusted. This is normally in a 10 mm metal can with a screwdriver slot about 4 mm wide. It is often coloured red. At other times the coil may be a different shape, include a hexagonal hole or small slot for alignment and be covered in wax.

If in doubt, tune to a weak station and adjust the coil. If the station stays on frequency, but the volume drops, you have found an IF transformer. Adjust it back and repeat for the other coils. Once the local oscillator coil has been identified, turn it anti clockwise and observe the stations move down the dial.



Adjust this until the receiver tunes 1850 kHz near the top of the dial

When the correct coverage is achieved (the 1.6 MHz narrowcasters should come in at about 1450 kHz on the dial) set the signal generator to 1825 kHz. Reduce its output so its signal is weak and peak the front end trimmer for maximum signal.

The conversion is now complete. To confirm your success, ask a nearby amateur to transmit a 160 metre AM test signal or wait for one of the sessions mentioned below. As a final touch, recalibrate the dial (by printing frequencies onto label paper) and add a 'converted to 160 metres' label.

## 160 metre activity around Australia

Some states relay their divisional or club broadcasts on 160 metres. These are usually followed by callback sessions. Some regular nets are also held on 160 metres. Those that are known are listed below. All activity is AM unless otherwise noted and times given are local. Frequencies used are between 1825 and 1850 kHz.

- **Adelaide:** Sunday 9am VK5WI News.
- **Brisbane:** Sunday 9am QNEWS (SSB)
- **Melbourne:** Sunday 9am Morning AM net. Monday-Friday 11am Coffee Break Net. Wednesday 8pm APC News. Saturday 10:30pm Crossband 'Missions' (live contacts and recordings from the last thirty years).

- **Sydney:** Sunday 10am & 7:30pm VK2WI News.

During most evenings one or two CW and SSB signals can be heard on the band. Reception of these is possible on converted sets equipped with a BFO. Details on how to do this are provided elsewhere.

## Results and use

Results will vary depending on the sensitivity of the converted receiver and how well its front end has been peaked. If there is no 160 metre amateur activity, the low powered narrowcast stations above 1600 kHz are a good test of the receiver's performance.

160 metre AM transmissions up to approximately 30 kilometres distant are plainly audible on a typical converted AM set used indoors with its internal ferrite rod antenna. If the receiver is particularly sensitive and/or the transmitting station is using an efficient antenna, this distance can be extended up to a few hundred kilometres. Turning off electrically noisy appliances, such as so-called 'high efficiency' compact fluorescent lights, switch-mode power supplies and computers will often reduce unwanted noise.

A directional tuned loop antenna dramatically improves reception, even on the deafest of receivers. This consists of a cardboard box, wire and tuning capacitor and was described in the reference. Alternatively a wire antenna can be used. If the receiver has no antenna connection, one can be added

by making a two turn winding on the receiver's ferrite rod. One end is connected to the receiver's earth (normally the negative (-) battery connection) and the other goes to the antenna.

SSB and CW signals can be resolved by using a beat frequency oscillator. This can be arranged by placing another (unmodified) AM broadcast receiver alongside the receiver being used. Tuning just below 1400 kHz will cause the local oscillator signal to be around 1800 kHz, which will be usable as a BFO. Note though that unlike BFOs operating at the IF, the BFO receiver will need to be retuned every time the received frequency is changed.

Coverage can be extended to other HF and VHF bands by building a two or three transistor crystal-controlled converter ahead of the receiver. Such a converter has already been constructed for ten metres FM and will be the subject of a future article.

## Conclusion

A comprehensive description of how to convert AM broadcast receivers to cover 160 metres has been provided. In areas where the band is popular it should make a fun project for beginners and experienced amateurs alike.

## Reference

Novice Notes, *Amateur Radio*, May 2001

AR

# Measuring Aerial Field Strength

This note was supposed to be placed at the end of the article on page 21 on the June AR. My apologies to the author.

## Notes

The energy content in a radio wave (i.e. its ability to do work) is evidenced by the acceleration of electric charges present in a metallic conductor or a plasma in the path of the radiation. The rate of flow of energy through an area in the path of the radiation is the intensity of the radiation, measured in joule per second per unit area. The standard unit of intensity is watt per square metre.

The energy has two in phase components, an oscillating electric field E and an oscillating magnetic field M. E and M are the RMS magnitudes and the product is the field intensity I watt per square metre. The units for E are volt per metre and for M, amp per metre.

$I = E M; E/377 = M,$   
 $E^2/377 = I; 377 \times M^2 = I$  (1)  
377 is the intrinsic impedance of space. Actually  $120\pi$ .  
The magnitude of E or M is the

radiation field strength and from a measurement of either one, the others can be determined using the statement at (1). The open circuit volts ( $V_o$ ) at the centre of a dipole divided by its effective length or height (h) in metre is the electric field strength of the radiation intercepted by the dipole in volt per metre.

That is the basic principle of the field strength meter.

Lindsay Lawless VK3ANJ

VSUE

# Women in Radio

Christine Taylor VK5CTV

## Dorothy Bishop VK2DB

Dorothy (Dot) VK2DB is well known to many YLs around the world, not so much from being an avid DXer but rather from the ongoing contact she maintains with YLs and YL organisations because she is Editor of the ALARA Newsletter.

Dot developed an interest in amateur radio in the 60s but it wasn't until 1978 that she took that positive step and gained her Novice call. Licensed as VK2NVQ, she held regular daytime skeys with her YL friends including Joy VK2EBX (now SK), Daphne VK2KDX (also now SK) and Betty (then VK2NYL, VK2KYL and finally VK2AMU). Around 1983, Dot and Betty decided to put some intensive effort into upgrading their Morse speed and held twice daily Morse practice sessions with each other.

Dot couldn't understand why she was inserting occasional "M"s into the text as she received Betty's transmissions. This went on for some weeks and Betty was adamant that she wasn't sending the "M"s. Then Dot suddenly realised what was causing the problem. She had only recently had her fourth son, Roger, who she would nurse on her lap while she operated and it was Roger's stage in infant life where his favourite (and only)

word was "Da Da". This he would liberally and loudly proclaim whilst the practice sessions were in progress but, inadvertently, Dot would copy the "Da Da"s into the received text. Dot may have sent out a few extra "Da Da"s but Betty didn't seem to complain at the time.

Maybe it was because of the difficulties of learning how to balance Roger, the key and the pen that enabled her to quickly master the higher speed and in 1985, she upgraded to VK2DDB. Very active on the 222 YL net on Mondays during the late eighties and the nineties, The net controller started to lightheartedly refer to her as VK2 Dot's Doing Baking because every Monday night was roast night. A roast was especially chosen because of the simplicity of putting everything into the oven and not having to worry. Unfortunately the phonetics were occasionally changed to VK2 Dot's Dinner's Burnt reflecting the unfolding



conditions in the kitchen. Several years ago she also obtained the VK2DB call when it became vacant which she now uses as her principal callsign (whilst still retaining VK2DDB).

It was in 1991 that she took on the role of VK1/VK2 ALARA Representative and a year later became Editor of the ALARA Newsletter, both positions she holds today. She was also responsible for launching the ALARA website in 1998 which she hosted on her own webpage

*continued next page*

### HIGH PERFORMANCE TRANSVERTER for the 2 m und 70 cm band

#### Technical Specifications:

- Type
- VHF/UHF Frequency range
- IF Input power
- PTY control:
- Output:
- Operating voltage:
- Current consumption:
- RX Gain
- Noise figure
- Dimensions mm:
- Case:
- IF connectors:
- RF connectors:
- DC supply and control connector

**TR 144 H**  
144 - 146 MHz  
1 - 50 mW, adjustable  
contact closure to ground  
25 Watt @ 50 Ohm  
13.8 V DC (12 - 14 V)  
max. 6 A  
typ. 15 dB output  
max. 0.8 dB NF  
278 x 258 x 38  
aluminium  
BNC - female  
N - female  
SUB-D 9-polig

**TR 432 H**  
432 - 434 MHz  
1 - 50 mW, adjustable  
contact closure to ground  
20 Watt @ 50 Ohm  
13.8 V DC (12 - 14 V)  
max. 6 A  
typ. 10 dB  
max. 1.8 dB NF  
278 x 260 x 80  
aluminium  
BNC - female  
N - female  
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Price without VAT

# Joy Charles VK5YJ

Joy first encountered the world of amateur radio during WW2. She was working as a receptionist for a timber merchant when a young man came in wanting some long lengths of oregon. She asked what he wanted them for, as one would with an unusual inquiry.

"I am going to build an aerial," he replied.

"What sort of aerial?"

"An amateur radio aerial. I am a radio ham. I want to build an aerial and put it on a tower so I can hear more hams around the world. The aerial will allow people further away to hear me."

"It sounds interesting and different. I will find out if we have any oregon in the lengths you want," said Joy, somewhat mystified still.

The timber company did have the oregon required and so Joy met her future husband, Ted VK5YQ, and heard about amateur radio for the first time.

The next step occurred some years later by which time they had married and made a home - with amateur shack and had six children.

Joy suffered from laryngitis almost every winter so it had become customary for Ted to call Joy each day, from work, to check up on her and the children. Mostly the conversation was one sided, but it did keep them in touch.

However, one day there was some information about a family member which simply had to be passed on before Ted came home. Joy was not allowed to even try to talk so she decided she would have to "tell" Ted using Morse Code.

She found a copy of the code, and laboriously wrote out the dit and dahs to make up the message. Then she practised whistling the message.

Joy wasn't a very good whistler, but when the expected call came from Ted, instead of just listening as usual, Joy

whistled. After some minutes of this, with Ted woke up to the idea. He got the message and was able to attend to it on the way home.

That night he made up an audio oscillator with which Joy was able to 'talk' to him when she had laryngitis. A vast improvement!

Some years later, in 1978 when the Novice licence was introduced Ted suggested that their son Kim go along to classes. Kim suggested that Joy should go instead. After all she was already proficient in CW. So Joy joined a class of 79, run by the WIA(SANT) Division.

By the end of the course all but 17 students had dropped out. Eventually only 10 of them sat for their exams and passed. One of them was Joy. A year or so later she upgraded to VK5YJ. Her son Kim and one of her daughters, Joylene also have licences. Kim took over Ted's call after he became a SK.

For some years Joy ran WICEN in VK5, organising exercises and running a regular net each week but lately has moved on to other interests though she still offers her services for the Classic Adelaide Rally when she can.

Joy is much too busy in another field of radio these days, for much amateur activity. Joy runs a regular Wednesday afternoon session on commercial radio, on 5UV, one of those important services run by volunteers.

5UV started life as the 'voice' of what we now call Open Learning, from the University of Adelaide campus. Now it



is housed in a building on North Terrace opposite the University but a separate entity. The Open Learning lessons continue but only during the night. Daytime is devoted to programs of general interest. When they moved into the new premises a few years ago a 'window on the world' was included in the design. One of the studios can be viewed from the footpath alongside.

Joy's session of conversations, interviews and music has earned her a place in the hearts and homes of many during the 15 or more years she has been involved. She spends hours each week planning and choosing the music and she enjoys the friendships she has made through this other radio mode. They add to the friends Joy has made through amateur radio and ALARA. Communication has many faces.

BT

## Dorothy Bishop VK2DB continued

coopting one of her sons, Peter VK2ZCU, to be the webmaster. Recently, she has arranged for alara.org.au to be a domain name in its own right.

Dot puts out the WIA NSW Divisional Broadcast onto the packet radio system (under the callsign VK2DDB) and is also Secretary of the Hornsby and Districts Amateur Radio Club. On top of all this, if she still wasn't busy enough with family (still 3 'boys' and one OM, VK2ZOI, at home), she takes an active

interest in the local community by being very involved with her local Neighbourhood Watch, editor of the monthly local NHW Newsheet and also a member of the Hornsby Community Safety Committee.

One amateur radio event that she regularly ensures ALARA is represented is the Central Coast Field Day. She actually has more OM visitors, some with XYL in tow, calling in and signing the visitor's book and assumes this is

because most OMs would like their XYL more involved in the hobby. Dot tries to promote the hobby to non-YLs, not because it is something that they can share with their OM but rather because of the unique bond that is developed between YLs worldwide. She would like to see more YLs take up the hobby and sees the possible introduction of the Foundation style of licence into Australia as a golden opportunity to help achieve this

Item provided by John VK2ZOI.

## North East Radio Club, South Australia

The NERC was formed in 1991 by a group of interested Amateurs from the Modbury/Tea Tree Gully area in Adelaide. We currently support a 2 metre and 70 cm repeater, Morse beacon and packet repeater.

Club web site <http://necr.vk5bbs.ampr.org>.

The club meets on the second Friday of every month. Visitors and new members welcome.

April 12<sup>th</sup> saw the club host a successful buy and sell day, at the May

meeting Brian VK5VI gave a talk on the history of FM and repeaters in the Adelaide area. This also included some slides of the recent removal of VK5RHO to another site. This change has saved quite a lot of money in site rent.

June meeting is a talk by Andrew VK5ZUC on MRI and Ultrasound techniques. Both these devices use lots of high power RF. Could we connect an antenna to the local MRI? More on this next month.

July 12<sup>th</sup> will be our AGM, starting of

with a meal at the clubrooms followed by the business meeting. Advance notice for the August meeting, it will be a talk on Fox Hunting by Keith VK5OQ.

Club members will be involved in August with the Rally of SA, the 4<sup>th</sup> round of the Australian Rally championships. This is an annual event for which the local Adelaide clubs and WICEN provide scoring and safety communications.

**73, David Clegg VK5AMK**  
Hon Secretary  
[vk5amk@chariot.net.au](mailto:vk5amk@chariot.net.au)

## Southern Group Luncheon

A luncheon was held on 25<sup>th</sup> May for the Southern Group. There were about 20 at the table this time, one of the larger gatherings. All these people either have come to live in the Victor Harbour district or have lived there at some time. They are old friends, making the most of an opportunity to spend a pleasant few hours together.

After the luncheon, this time, most of

the diners moved to the home of one of the locals, which has a fantastic view of the bridge that joins the town of Goolwa and Hindmarsh Island. This bridge was much in the newspapers several years ago. The wide sweeping design makes the bridge worth a visit if you are ever in the vicinity. Quite beautiful.

The next lunch will be in August. If you have any connection in the area and

would like to join the group, just get in touch with Christine VK5CTY for details.



Garry Herden VK5ZK and Henk Brokken VK5BHH, both regulars at Southern Group meetings

## Adelaide Hills Amateur Radio Society

In May the club had a visit to the Railway Signal, Communication and Aviation Museum. Approximately 50 members and visitors attended. The fact that it was difficult to get members to vacate the premises at 1030 is a good indication that the museum was of great interest to everyone.

The film which started the evening, of the historic flight from England to Australia by Sir Keith and Ross Smith a Vickers Vimy (the actual plane is housed in a special building on Adelaide Airport) in 1919, included some genuine film segments in it. The typical, laconic, Australian comments were enjoyed by all. Those early took the dangers for granted. One room of the museum has a large model of the Vickers and much more aircraft memorabilia.

Another room houses communication equipment used in the railways and on the Overland Telegraph. This brought

back memories to some members with experience in the old Post Office as well as in the railways.

In several rooms massive railway signaling equipment was set up so it actually operated light signals of several sorts. Many people 'had a go' at these machines, but all were amazed at the massive size required in railway operations.

It is great to have a place where vintage machines are still preserved for us to marvel at. It is so easy to forget.

Any amateurs in Adelaide could spend a very enjoyable couple of hours in this museum. It is open every Sunday and at other times by arrangement.



Rob Gurr VK5RD using a morse key at the Railway Signals and Communication Museum during the May visit

## Silent Key – Doug VK4BP

It is with great regret we must report that Doug VK4BP, the OM of June VK4SJ, became a silent key while they were on a DXpedition on the island of Raratonga. As reported in the May AR, June and Doug had been running a series of radio stations on some of the Cook Islands. I'm sure many amateurs around the world made contact with their stations during that time. Sadly, on May 9<sup>th</sup>, while Doug was taking a break and enjoying touring the island on a motorbike he was involved in a traffic accident and died a

few hours later in the hospital.

This particular DXpedition was one of a number June and Doug have participated in during the last few years. Frequently the main intention of the expedition was to have a YL station in one of the more unusual call areas, but Doug also operated the station and was an important part of the team, erecting aerials and assisting wherever there were technical problems.

Doug will be sadly missed. He and June have been very active DX operators

for many years and have made many friends through amateur radio.

Although transport to Raratonga is not the easiest to access, June's two sons were able to get there. Doug's body was brought back to Australia where a funeral was held in their home town of Caloundra in the last week of May.

ALARA and the amateur community send their best wishes to June and family. See you on the air again when you are ready.

## 222 Net

As reported before, during June's absence in the Cook Islands Dave ZL1AMN has been running the 222 net on a Monday afternoon. The difference in propagation was noticeable as soon as daylight saving ended across the world. The slightly more reasonable

hour of the morning for the UK and Canadian stations means that there are now often DX stations to be heard.

Please do join in on a Monday afternoon (for us in Australia). The 222 net starts at 0530 Zulu and continues as long as there are any stations who wish

to talk to each other. The topics of discussion are many and varied but usually include a weather report. It is interesting to note how different the weather is a different part of Australia and in different parts of the world.

*continued next page*

**ALARA***Events.....*

**ALARA NETS MONDAYS** Afternoons at 05.30Z on 14.222 MHz. The 222 net. Evenings at 10.30Z Daylight saving, 10.00Z rest of year. 3.58 MHz

*Birthday Net***July 26<sup>th</sup>****at 10.30Z on 3.580+/-***Contest***August 30<sup>th</sup> -31<sup>st</sup>****Rules as for 2002 and printed in June 2002 AR.***International YL Meet***Seoul 2004****ALARA***Nets.....***MONDAYS****AFTERNOONS****05.30Z ON 14.222MHZ  
'THE 222 NET'****EVENINGS****10.00Z (daylight saving 10.30)  
3.58MHZ+/-****EVENINGS****12.00Z 3.58MHZ+/- VK6NET****THURSDAYS****EUROPEAN YL NET  
14.243 MHZ AT 17.00Z****FRIDAYS****VE, VK, ZK NET  
14.148MHZ AT 05.00Z****Grow WIA...****Recruit a new member!**

## The International YL Meet in Seoul in October 2004

A comprehensive itinerary has now been arranged for the next meeting of YLs in Korea next year. The web address is rather long and complicated but information can be obtained from Chae, Do Sook at her e-mail address h12kdw@hotmail.com The weather in Seoul in October is expected to be between 15 and 20 degrees Celsius. Registration will be on the 8th October

and there are two tours offered as options to follow the MEET

The activities during the MEET itself include a visit to a Korean folk village, a city tour of Seoul, and a visit to the Samsung Electronics company in Suwon. If the experience of the International MEET in Hamilton in New Zealand is anything to go by, everyone will have a marvelous time, meeting old

friends, and making new ones

If you have any plans to tour the Far East in the year 2004, try to include the meeting in Seoul on the list of important places to be.

We are assured that South Korea is in very safe and friendly place to visit and even walking in the city streets is perfectly safe. Do contact Chae, Do Sook for more information.

## Don't forget ALARA's birthday is in July

On Monday 21<sup>st</sup> July 1975 the first ALARA Net was held on air. We commemorate this date each year by holding a special Birthday Net on the last Saturday night of July each year. This year the date will be 26<sup>th</sup>. Please put it in your diary. Unfortunately the

only band we can use to talk to the whole of Australia at night is 80 metres so we will use the 3.580+/- MHz we use on Monday nights, starting at 1030 Zulu and running for as long as we wish.

VK5 will also have a Birthday Luncheon, probably on the following

day. All VK5 members will be informed of the details. If any YLs are visiting Adelaide at around that time, please contact Jean VK5TSX, our State Rep, or Christine VK5CTY. Both are QTHR the callbook.

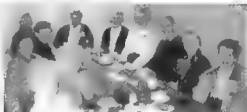
## Luncheons in Melbourne and Adelaide

In May, extra faces were noticeable both in Melbourne and in Adelaide. In Adelaide, Tina VK5TMC, Jeanne VK5JQ and Leslie XLY of Hans VK5YX were welcome additions.

However, on that same day, in Melbourne there was a real crowd. Judy VK3AGC arranged a visit to the doctor

for that day. She brought her house guest, Bev VK4NBC with her Meg VK5YJ and OM David VK5OV made a point of fitting a VK3 luncheon into their family visit, and with all the usual attendees, Mavis, VK3KS, Bron VK3DYF, Gwen

VK3DLY, Jessie VK3VAN, Robyn VK3WX and Jean Shaw, present. It was an exciting and interesting gathering.



From the front L, clockwise, Judy VK3AGC, Immediate past president Bev VK4NBC, Maureen Shaw ZL4AN, Gwen VK3DYL, Bron VK3DYF, Jessie VK3VAN, Mavis VK3KS, Meg VK5YG, David VK5OV, President Robyn VK3WX and Jean Shaw.

## On May 9 I was in Melbourne and able to join the ALARA girls for their monthly luncheon.

The photo was taken by a fascinated bystander who was lunching nearby, and thought she could capture us all around our table enjoying one another's company! By moving furniture and standing on a chair she certainly succeeded.

We thought we did well to have members from New Zealand, Queensland and South Australia present at the VK3 lunch, not forgetting the lone OM!

## Silent Keys

### Lew Jarvis, VK7LJ

It is with regret that we have to announce the passing of Lew Jarvis, VK7LJ. Lew was born in October 1927. He became a silent key on Tuesday 13th May. Lew will be well remembered by many amateurs. He was a long time active member of the "Sewing Circle". Our condolences to his family and close friends from the Tasmanian Division. Rest in Peace Lew.

### Kenneth J Ledsam VK2ST

2 Ivor St Lidcombe NSW  
Passed away 10/11/02

### J.G. (Greg) Wilson, VK2IGW, (41)

#### Late of Pottsville and Casino areas.

Regrettably Greg passed away in Sydney on about 5 May last. He was in hospital for treatment and developed Golden Staph in his liver. He suffered diabetes and liver trouble for many years. We express our condolences and best wishes to his family and friends.

Extracted from Summerland ARC News

### Terry Wilson, VK7HTW

It is with regret that we have to announce the passing of Terry Wilson VK7HTW. Terry's contribution to his radio hobby was outstanding and brought together a bond and friendship from all over the world. His promotion of IRLP and the Tasmanian Devil Award was one of the successes that Terry achieved even though he was quite unwell. We will miss his comments and joy from the airwaves. Our condolences to his family and close friends from the Southern Tasmanian ATV and Digital Group. Rest in Peace Terry.

## The Flying Horse is back!

Some of you may remember the famous double telephone directory sized callbooks that were produced by the "Radio Amateur Company" in the USA. The front cover was a picture of a 'Flying Horse'. They ceased production in 1997 when the world call book became available on CD's. It has raised its wings again! A German firm, ItfM (Informations-Technologie für Menschen) in conjunction with the UK RSGB and the German DARC, have purchased the rights to the Radio Amateur Callbook. Hopefully by the time you read this, the RSGB will have a new World Call Book available for purchase.

(RSGB May RadCom)

## ARRL'S "Logbook Of The World" enters open beta-testing phase

The long-anticipated "Logbook of the World" (LoTW)—the ARRL's secure electronic contact-confirmation system—has been opened for beta testing. While a formal unveiling was set for the Hamvention DX Forum May 17, LoTW now is available to all who wish to participate in the beta testing program.

At the heart of the Logbook of the World concept is a huge repository of log data provided by operators—from individual DXers and contesters to major DXpeditions—and maintained by ARRL. Logbook of the World Project Leader Wayne Mills, N7NG, says the system will benefit big and little guns alike by providing quick QSO credit for awards offered by ARRL—and, it's hoped, those offered by other organisations as well—without having to first collect and submit hard-copy QSL cards.

Visit the ARRL Logbook of the World Web site <http://www.arrl.org/lotw> to learn more, download the necessary software and take part in the beta testing effort. For the purposes of the beta test, validated users are asked to submit log data for contacts made on or after January 1, 1998. Once a certificate is issued, beta testers may e mail their log data to the LoTW database [lotw-test@arrl.org](mailto:lotw-test@arrl.org).

(ARRL N/L 17/4)

## Amateurs in other fields

When promoting Amateur Radio we often talk of our development and research projects, our exploitation's in space, WICEN and our contribution to the community. A smile came on my face when I read a column in the ARRL News Letter asking for Radio Amateurs to track wildlife. Three new tracking projects were studies of the Florida burrowing Owls, Green horned Owls and Mexican long nose Bats. It appears some of these have been radio tagged, so be cautious of the strange noises you here on VHF. It could be a bird that has strayed off course.

## Only in America

In the State of New Jersey the gloves are off! Some Law maker is endeavouring to amend the State law so that a "distracted driver may be charged with reckless, careless or unsafe driving" for engaging in what motorists would consider routine activities such as listening to the radio, a CD or cassette player. You can imagine arriving from another State and having to turn everything electronic off. It surely makes you wonder!

## New 60-metres requires prudence, caution

When the five channels of the new 60-metre amateur allocation become available later this year, Amateur Radio operators will have to learn some new operating habits and adopt some new on-the-air attitudes. The limited spectrum and stringent bandwidth requirements will mean amateurs will have to demonstrate their best behaviour and operating skills if the Amateur Service ever hopes to get an actual band segment at 60 metres.

"In terms of Amateur Radio spectrum, we usually say, 'Use it or lose it,'" said ARRL CEO David Sumner, K1ZZ. "The watchword for 60-metre operators should be, 'Misuse it and lose it.'"

The NTIA says that hams planning to operate on 60 metres "must assure that their signal is transmitted on the channel centre frequency." In general, the NTIA

has advised, users should set their carrier frequency 1.5 kHz lower than the channel centre frequency. According to the NTIA,

Channel Centre Frequency	Amateur Tuning
5332 kHz	5330 5 kHz
5348 kHz	5346 5 kHz
5368 kHz	5366 5 kHz
5373 kHz	5371 5 kHz
5405 kHz	5403 5 kHz

(common US/UK)

Additionally, the FCC has restricted operation to USB only, with a maximum effective radiated power (ERP) of 50 W. A dipole is assumed to have a gain of 0dBd.

ARRL Technical Relations Manager Paul Rinaldo, W4RL, says the assignment of these channels implies that amateurs now must adhere to certain frequency tolerances for their use. While the International Radio Regulations don't list these for the Amateur Service, he notes, they do stipulate tolerances on the order of 20 to 50 Hz for other services.

"We haven't been told anything specific about frequency tolerances for these channels but would probably annoy federal regulators if we strayed any more than 50 Hz from the assigned carrier frequencies," Rinaldo cautioned.

Keeping one's audio within the 2.8-kHz wide channel to comply with the 2K8J3E emission specification is another important issue. ARRL Laboratory Manager Ed Hare, W1RFI, believes prudence calls for not having baseband audio below 200 Hz nor greater than 2800 Hz—for a total bandwidth of 2.6 kHz. "That will probably keep us out of trouble," he said. Noting that the high-frequency response "can vary a lot from radio to radio," however, Hare recommended that amateurs play it conservatively.

It is a pity the ACA has not offered us a similar opportunity to investigate propagation in the 60 metre band, if only for a limited time. It would surely make worldwide studies more realistic with Australia being so far from the USA and the UK.

(ARRL N/L 23 May)

## Entry Level licence:

# WIA Consultation Survey findings

By Jim Linton VK3PC

**The survey on the proposed new Entry Level licence conducted throughout Australia has had a very positive result of promoting greater awareness of possible changes to amateur licensing in Australia.**

A joint survey was conducted in VK2, VK3 and VK7, while other states and the ACT held surveys of their members, based on a standard set of questions. This report is on the results of the joint survey only.

It got people talking, thinking, and also informed a few who had missed or dismissed earlier reports that the WIA was considering how best to re-shape licensing for the future.

With the amateur radio fraternity now facing a rapid decline in the numbers of radio amateurs the WIA Federal Council,

at the WIA's 2003 Federal Convention, voted unanimously to give "in principle" support for a new Entry Level licence. The WIA is looking for sustainable growth for amateur radio in Australia.

A key part of its policy is that the new licence would be on the majority of bands "to be determined", and that consultation with the amateur radio fraternity would seek to measure the feelings of today's radio amateurs. The result is an endorsement of the WIA's policy direction.

The joint VK2, VK3 and VK7 survey which resulted in a total of 542 surveys responses fairly evenly across all existing licence grades, plus another nine responses which totally disagreed with the introduction of an Entry Level licence.

The support for 10 W (PEP) on all bands – which is what Britain has given its Foundation Licence with the current exception of 10 m – only had support of 7.4% of survey respondents.

In relation to power levels, this was fairly evenly divided with 10 W (33.39%), 50 W (25%), 100 W (37.8%), with 4.79% supporting 200 W.

Some 36% wanted to give the new licence all (entire) bands, while the majority (64%) said no to that option, although they mostly supported the new licence having parts of some bands rather than the entire band.

The survey's question No. 8 sought multiple answers. Interestingly, 19% or about one in every five respondents, did not want the new licence to have access to weak signal segments that are part of

band planning on the higher bands.

This is particularly significant if one considers that weak signal working is a speciality area of operation that would not necessarily be widely known or appreciated by all respondents.

On the question of whether Entry Level licensees should be given access to repeaters only 3.32% were opposed.

Questions about the bands that should be included in the licence revealed a strong preference for the existing Novice band HF allocations, but also healthy support of mid to high 50s for all other bands including 59.22% for 20 m.

The 75 m DX window, another speciality area of amateur operation, saw 80.7% of respondents not wanting it included in the privileges of the new licence.

On the VHF/UHF and microwave bands, 2 m and 70 cm gained almost 100% support, with 6 m at 75.46%, 1.2 GHz 62.36%, 2.4 GHz 57.56% and 5.6 GHz 50.92%.

## Conclusion

Those who responded to the tri-state survey do not support the British model of 10 W on all bands, although they recognise the need for a new entry point into amateur radio and the survey respondents gave their support for such a move in Australia.

In relation to bands, the respondents have naturally considered the new licence in terms of their knowledge of the current Novice licence. This is clearly evident in Table 1. While some see it as a replacement for the Novice, others have a wider view of the Entry

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Level licence needing to be sufficiently attractive to hold the interest of the next generation of radio amateurs. There was a sentiment that the new entrants should be restricted as an incentive to upgrade to the Unrestricted licence

In Table 2, support for power levels is evenly spread, and again those who chose the 100 W limit probably did so to match it with the current Novice power level. A number of respondents referred to the 10 W limit not as being easily enforceable, or that up to 100 W was the normal power level from readily available commercial ham transceivers.

Among the clear messages from the survey results are that weak signal segments must be quarantined from the new licence, likewise the 75 m DX window, and 97% supported Entry Level licensee having access to repeater operation.

The survey results are now being used to help the WIA write its submission to the Australian Communications Authority seeking the introduction of an Entry Level licence.

The results will also further stimulate debate on the issues, and further consultation with the amateur radio fraternity on the proposal can be expected.

## Comments made by survey respondents:

A number of those responding to the survey took the opportunity to express some personal opinions. A selection of them appears below. Not all are included to avoid repetition and inaccurate references to Australia's current regulations.

*The more the better or we die – Roy Yeats VK2BRY.*

*It seems necessary to restrict some of the bands to create an incentive for further education requirements – O.A. Roberts VK7JR.*

*It will offer great opportunities for involvement for not only young people but catch the interest and imagination of retired people interested in electronics – John Collins VK3TKH*

*I agree we need more "active" ham operators, however, I don't agree that we should "give away" our privileges like tokens out of a Cornflakes packet. We need to maintain our high standards and our integrity. I am not opposed to a restricted entry level – O. Roberts VK2DCJ.*

**Table 1**

Band	Preference by those who did not vote for all bands (actual numbers)	Preference of those who did not vote for all bands (percentage)	Percentage of all respondents including those who voted for all bands.
160 m	115	33.4%	57.19%
80 m	354	99.0%	99.6%
40 m	196	56.4%	72.14%
30 m	115	33.14%	57.19%
20 m	126	33.31%	59.22%
18 m	112	33.27%	56.6%
15 m	300	86.45%	91.32%
12 m	124	35.73%	58.85%
10 m	242	69.7%	80.62%
6 m	214	61.67%	75.46%
2 m	367	98.0%	98.0%
70 cm	333	95.96%	97.41%
1.2 GHz	143	41.21%	62.36%
2.4 GHz	117	33.71%	57.56%
5.6 GHz	81	23.34%	50.92%

**Table 2**

Power Limit	Total number of respondents choosing these power limits	Percentage of respondents choosing these power limits	Respondents who support all bands with this power limit	Percentage of respondents wanting all bands with this power limit
10 W	181	33.3%	51	7.4%
50 W	136	29%	47	8.6%
100 W	205	37.8%	78	14%
200 W	26	4.79%	21	3.8%

*Concern over 160 m access due to BCI problems for Entry Level technical capability – Allan Mason VK2GR.*

*I think it is important to make entry easier but retain the "carrot" incentive to attain the ultimate goal a full licence – Ernie VK3DET.*

*Most transmitters are 100 W – so why add a hurdle of having to reduce power output – Bruce VK3BPT.*

*It is no use proposing a lower power limit as it did not work with the original Novice Licence – Ron VK7RM.*

*I would not like to see the "floodgates opened", however we must allow new hams greater access to our bands and foster their promotion to higher levels of access – Phil Maskrey VK3HBR.*

*I fully agree with the new Entry Level licence. I feel it will help maintain the interest in amateur radio – Doug VK3VBA.*

*I'm a dedicated CW enthusiast but fully support the removal of the Morse test as a requirement for an Unrestricted licence. I would encourage new licensees*

*to "have a go" though, so would include Morse code as an optional part of the Entry Level training course – Bernard Kates VK2IB.*

*There is bound to be a bit of backlash against this proposal, though I think it is an excellent idea – Graham Smith VK3ZGS.*

*The new licence class should be given access to all repeater sub-bands. With the advent of Internet linking, the retransmission restrictions in VK are rapidly becoming unworkable. Giving all amateurs access to all repeaters, eliminates this problem – Tony VK3JED*

*I would support full access (to VHF/UHF and microwave bands) providing compliance with WIA band plans could be enforced and guaranteed so as to avoid interference on weak-signal segments – Chas VK3BRZ.*

*Given the proposed minimal technical knowledge requirements for Entry Level, this licence should permit the use of commercially available equipment only – Ted VK2ARA.*

## VK1 Notes

### Forward Bias

Peter Kloppenburg VK1CPK

Have you ever heard the sounds from PSK-31, MFSK-16, or FSK-441? Our guest speaker at the general meeting on May 25, 2003 was Waldis Jirgins (VK1WJ). Waldis has spent much of his time during the last two years experimenting with the new narrow-band Digital Modes (DMs) and has had tremendous success with it.

With the use of a personal computer (PC), he showed the different displays that some of these DM programs generate, and which show all the information that the operator needs to conduct a QSO using this new form of modulation. But it is not only what you see on the screen, it is also what you hear during a QSO. Much to our surprise, Waldis let us listen to the various sounds that are so peculiar to each mode. We heard warbles and tweet-tweets from PSK-31, squeaks, chirps, and hiss from MFSK-16, and chirks, whirrs and whistles from FSK-441. Closing your eyes, it sounded much like your neighbour's aviary.

Waldis said that the SSB transceiver's RF output power should be set at between 30 and 70 watts, because the new DMs need much less signal power to be resolved than SSB. Any old transceiver can be used, but preferably one with a narrow-band CW filter of 250 Hz. He added that the normally fitted SSB filter of 300-3100 Hz in a transceiver can practically pass several DM signals all at once. Kerry Richens (VK1KRF) assisted Waldis by showing how a four-

wire cable is used to connect the transceiver to the PC i.e. Earth, Audio in, Audio out, and Press-to-talk (PTT). These are usually available at the microphone socket, or at the rear of the transceiver. Those of us with a Packet set-up, have such connections installed already. The station's antenna can be a simple type such as a dipole or a quarter-wave vertical. The entry level PC is a 486DX33, with which you can run PSK31SBW and not much else.

Waldis said that your PC should be equipped with a 16-bit sound card, or an integrated system. The monitor should be 'RF interference quiet' because a transceiver set up for DM is extremely sensitive to noise. If it is not, you will hear lots of hash on the HF bands. Waldis discovered that this hash is a function of screen resolution and colour-depth, and can be reduced by selecting a lower resolution, and screen size. He advises to place ferrite chokes on the keyboard and mouse cables when operating on the VHF/UHF bands, as they have a length equal to a quarter wave antenna. Waldis noticed that suitable PCs can be bought for less than \$100 via the Tuesday issue of the Canberra Times.

Waldis spoke to the subject of DMs for more than an hour, and handed out a nine-page pamphlet with details and background of DMs. You can obtain a copy of this via his Website on: <http://members.optusnet.com.au/~waldis/digital.htm>

The speaker following Waldis, was Gilbert Hughes (VK1GH), the division's federal councillor. Gilbert gave an update of the discussions going on within the WIA hierarchy about the new entry level licence, aka, the 'Foundation Licence' (FL). He said that one suggestion had been that, a once only, short sharp break should occur at its introduction, when all existing licence holders, from Limited Novices to AOCF, would become "Full call Amateurs".

Another suggestion had been that FL holders will only be able to progress to 'Full call Amateur' status by adding value to the FL. For example, an operator who can demonstrate having made a very high number of QSOs on CW would add value to his FL. Similarly, an FL operator who excels in home-brewing transceivers or other electronic apparatus would add value to the FL. Again, an FL operator who has attained certificates for WAVKCA, WAS, DXCC, WAC, and other operating achievements would also add value to his FL. These values would be assessed by a committee or a board before an individual's FL was upgraded. A lively discussion erupted during the break, with many of those present asking Gilbert questions about the FL, and when it is going to be introduced. Gilbert emphasised that discussions are still going on in amateur circles all over Australia, and that the final outcome will be influenced not only by the opinion of amateurs, but also by that of the ACA.

Two announcements were made that evening. The first by Peter Kloppenburg (VK1CPK), who showed three, band-pass filters that he built for use during contest operations in the divisional hamshack in Ferrer. Peter distributed a three-page handout with information about why these filters are useful, how to build them, using parts from the junk box. A copy of the handout can be obtained from Peter at [pkloppen@austarmetro.com.au](mailto:pkloppen@austarmetro.com.au). The second announcement was from Peter Ellis (VK1KEP) about an open day at HMAS Harman on Sunday, July 6, 2003. Amateur Radio would be represented with a station operated by amateurs. However, the announcement here is unlikely to be effective as AR for July will drop in your letterbox after the event. The next general meeting will be held on Monday, July 28, 2003 at Scout Hall at 8:00 pm. Cheers.

**PLAN AHEAD**

**JOTA**

**18 - 19 October**

# VK2 Notes

Tim Mills VK2ZTM.

## Hello there

The 2003/2004 Divisional year is now well underway. Following the AGM Brian Kelly VK2WBK was elected President and Owen Holmwood VK2AEJ remained in the position of Secretary. The position of Treasurer is being filled by Noel May VK2YXM, in at the deep end, in his first year on Council. Retiring from Council after several years were Chris Minahan VK2EJ and Geoff McGrorey Clark VK2EO.

The first Conference of Clubs for the year was held in May. The next Conference will be held on the last Saturday of November. Clubs have been requested to update details of their membership, incorporation details and supply a current copy of their constitution. In the past, club postings have been made by photocopying material and mailing it to them from the Parramatta office. Where practical, Clubs are now being asked to accept this material by email.

The schedule for exams conducted at the Parramatta office for the rest of the year are as follows. July 20th with applications closing on July 8th. August 31st with close on August 19th. October 12th with close on September 30th. November 23rd with close on November 11th. The Co-ordinator for these exams is Pat VK2JPA. Would other VK2 clubs and groups conducting exams please keep the Parramatta office informed of the dates so that we may refer inquiries to them.

The Oxley Region ARC conducted their annual field day over the June long weekend. As usual they turned on very good weather. 93 registrations were taken. Many were fox hunters who took part in the various field events. The VK2 Division attended with a selection of the VK2 Bookshop. The next major field day in VK2 will be conducted by the Wagga ARC, this year in October. They have decided to move from the previous date in August and have nominated the October long weekend, the 5th.

The next Trash and Treasure at Parramatta will be on the last Sunday of this month, the 28th, followed, as usual, by the Home Brew Group meeting upstairs in the library. This gathering is

well attended where many now bring their show and tell projects, after which there is a lecture or a series of short talks on an increasing range of topics. To compliment the Home Brew gathering a project evening is starting up at Parramatta.

Aub VK2AXT, the Divisional Librarian, has had the assistance of work experience personnel in the sorting and cataloging of the back log of material.

This month the VK2WI team of Announcers and Engineers start the third quarter roster. We welcome John VK2JVV, who joined in the last quarter. We are always on the lookout for more personnel, either as Announcer or Engineer, or both - please apply. The larger the team, the more the load is spread.

The Hunter Radio Group 6 metre beacon is undergoing a site and frequency change. It will join the VK2RNC repeaters on the local elevated ground and will move to 50.287 in the CW mode. The St. George ARS UHF repeater on 8425 has moved from Hurstville to join VK2RLE 6800 at Heathcote. A new repeater has been established in the Snowy Mountains. The Dural VK2RWI 7000 is to get new equipment. The existing unit has seen over 25 years service.

Last May it was twenty years since the official opening of the VK2 headquarters building at Parramatta. The Division had sold its Atchison Street property at St. Leonards in 1982 when it became crowded out by development. The present Wigram Street property was purchased in 1982 and opened on 28th May 1983 by Federal Member, Mr. Gary Punch MHR. VK2 Division had purchased Atchison Street in 1959 when it was a small cottage. A hall was added to the rear and the basement served as the disposal store, the bulletin printing room and VK2AWI WICEN station. The extensions were opened by the WIA's first Secretary Wal Hannam VK2AXH on the 17th March 1962.

Earlier in the 1950s a Co-op had been formed and there had been moves to acquire a city property. Round the same time (1955) the present Dural property was established as a Home for VK2WI, opening on 15th May 1957 by The Hon

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Andy VK3IV

Allan Fairhall MHR VK2KB, Federal Minister for Interior. The Co-op did not proceed and they put their efforts behind the Dural project.

Members and visitors are welcome to visit VK2WI on a Sunday between 9.30am and 11.30am. The site is 2.5 km along Quarry Road from the junction with Old Northern Road. The five acre property has been getting a spruce up in recent times. In early March the local Rural Fire Brigade carried out hazard reduction on the sloping part of the block. This was the first fire through the undergrowth for at least half a century. It made a real difference, even if the 160 metre inverted dipole got a bit singed in the process. Some of the lower parts of the site have required some restoration work to counter possible erosion.

Since the beginning of the year another round of equipment maintenance has been undertaken, much of it for the first time since Jeff VK2BYY constructed and installed it

during the 1970s. It is a tribute to Jeff for the length of service it still provides. A separate transceiver has been installed for the 40 metre callbacks, overcoming the need for antenna and frequency changes on the previous shared systems. This has allowed the previous unit to be dedicated to the 80 metre callbacks.

In January a new SSB transmitter was commissioned for the evening 80 metre service, and the operators have become familiar with its existence. In March we added a reflector under the 80 metre dipole. It seems to have made some impression on the coverage. The move last year to use the 40 metre AM transmitter in the evening has provided good and alternative coverage. As winter has approached however it has appeared that the local coverage has dropped off although interstate coverage appears good. We also have to thank Aub VK2AXT who has spent considerable time and effort restoring some valve transmitter and receiver units as a back

up system on a couple of the higher HF frequencies.

Last March, the Division had the pleasure of a talk on the United Kingdom Foundation Licence by RSGB President Bob Whelan G3PJT, which was video recorded by the television unit of the Gladesville ARC. The 58 minute presentation is now available in the VHS format from the VK2 Bookshop, priced at \$10 post-paid Australia wide. It is ideal for clubs to inform their members and to provide a lecture at a meeting. It can also be shown on ATV. Contact details for the VK2 Bookshop are to be found via the links to the Internet or for the directory page on page 56.

We welcome news for these notes as well as the VK2WI news sessions. Please put fingers to the keyboard and let all know about your club, group or individual activity. It is also a means of recording information for later history. 73 until next month.

## VK3 Notes

By Jim Linton VK3PC

WIA Victoria web site: [www.wiavic.org.au](http://www.wiavic.org.au), email: [wiavic@wiavic.org.au](mailto:wiavic@wiavic.org.au)

### WIA Victoria AGM

The Annual General Meeting held on 22 May, saw 45 members attending. After a moments silence for those radio amateurs who had passed away in the past year, discussion opened on the reports of the President, Secretary and Treasurer - all had been distributed to members as part of the Annual Report.

The Secretary mentioned that current new memberships and renewals were at the same level as this time last year and it was hoped that the gain in membership evidenced last year could be repeated in the year to 31 December 2003.

The Treasurer commented that the projected surplus for the year to 31 December 2003, had been adversely affected by a continuing downturn in the value of the Westpac managed fund investment and the over budget cost of the Council election. Best estimates were that WIA Victoria would break even for the year, but further movements in the managed fund would be a factor in the end result.

The Chairman and members congratulated Drew Diamond VK3XU,

who was in attendance, for once again receiving the Higginbotham Award for his contribution to Amateur Radio magazine.

*Election of the 2003-2006 Council - the Chairman advised the meeting that more than 500 ballot envelopes had been received for the election of the new Council. Simulated trials had shown that the processing of ballots and result reporting could not be completed in the time that the meeting facilities were available.*

It was suggested, and accepted by the meeting that scrutineers would count the number of ballot envelopes received and report this figure to the meeting. There were 517 envelopes. The Electoral Officer was then assigned to deliver the ballot box and envelopes to the Accountants Barnard Baudinette & Co for vote counting and a report on the results.

The elections results posted on the WIA Victoria website were:

The 2003-2006 Council is Jim Baxter VK3DBQ, John Brown VK3JJB, Bruce Bathols VK3UV, Keith Proctor VK3FT, Barry Robinson VK3JBR, Jim Linton

VK3PC, Peter Elton VK3KG, and Peter Mill VK3APO.

All five sitting councillors who sought re-election were successful and are joined by Bruce VK3UV and Peter VK3KC.

The election was for eight positions, and the two unsuccessful candidates were Robert Broomhead VK3KRB and Mark Beacham VK3XXX.

After the AGM the traditional discussion session took place. Keith Proctor gave a presentation on the WIA Victoria Business Plan for the next three years, and invited input from members.

It was announced that the latest Inductee to the WIA Victoria Elmer Hall of Fame was Mark Weaver VK3KZZ. The WIA Victoria policy on IRLP was explained. The long awaited privacy policy for WIA Victoria will be released in July after the Council considers a report from its legal advisors.

The distribution of AR magazine via newsgroups had been a financial success so far. WIA Victoria is now running a trial of an electronic version of the magazine on its website as a PDF download.

## Entry Level licence survey

Thank you to those who responded to the WIA Consultation Survey on the proposed new Entry Level licence.

Some 40% of VK3 respondents wanted the new licence to have a power

output of 100 W PEP, with 30% preferring 10 W PEP, 50 W PEP 26%, and 3.8% in favour of 200 W.

The full survey results will be published (see page 30), but basically the combined view of the VK2, VK3 and VK7 respondents was that 64% did not want the new licence to have all bands,

and 19% did not want it to include the VHF/UHF weak signal segments.

The British model of 10 W and all bands gained only 7.4% support, while 3.3% thought it was not appropriate for the Entry Level licence to have access to repeaters.

## VK7 News

### IRLP + APRS = AVRS/ IPRS...Confused?

Tony Bedelph, VK7AX who owns and runs the Internet Repeater Linking Project (IRLP) node (6700) in the North of the Tasmania has been bringing together IRLP and Amateur Voice Reporting System (AVRS) in a new system called Internet Phone Radio System (IPRS). This system was pioneered by Dave Cameron, VE7LTD and Bob Bruninga, WB4APR and is now operating on IRLP or should I say IPRS Node 6700 in the North of Tasmania.

How does it work? IRLP Node 6700 simultaneously beacons its information and status to the Internet IGate Network and to the packet APRS network on 145.175 MHz. Users can now use the information in real time, with both the STN6700 and VK7AX IRLP information now shown on the Tasmania map for the Mt Barrow 2 metre repeater (147 MHz) and site which Node 6700 is permanently linked to at this time.

Another first and plus for amateur radio in VK7.

### VK7 Divisional Broadcast Replay

The weekly VK7 Divisional Broadcast can now be heard repeated on Monday nights along with a QNews rebroadcast on most of the Northern Tasmanian 2 metre repeaters at 1930 (local Tasmanian time). This rebroadcast is courtesy of Tony Bedelph, VK7AX.

### Targa Tasmania

The WICEN South team has done it again with the provision of high quality radio communications for this year's event. The weather was less than favourable and the command net satellite phones didn't work and WICEN members ended up using their own mobile phones as well as providing stage net radio links. Apart from some minor

problems like repeater sites which looked more like rivers than solid land, it all went smoothly and the WICEN team was highly commended for their work.

### Branch Meetings/News

The Northern Branch's June meeting was treated to a talk by the former Director of the Antarctic Division, Rex Moncur, VK7MO who discussed the new EMR rules and the VK9LS DXpedition to Lord Howe Island. As always Rex presented an informative and entertaining talk.

The North West Branch's meeting was something really different. The Branch's own world traveller, Warren Wright, VK7BN has been working in South America, then in Venezuela and now in Ecuador, mainly on oil rigs. His talk was very entertaining, especially about the conditions on the rigs.

The Southern Branch was treated to a talk by Peter Yates, VK7PY, who is the Communications Manager for the Antarctic Division that is based in Kingston, 10 km from Hobart. Peter talked about the whole gamut of Divisional Communications which started back in 1912 of which the Domain OTC site (featured in last month's AR inside front cover) was part of the old network. He outlined the HF and digital link developments, VHF, Wireless LAN systems, repeater networks and paging systems. There are special requirements for sub-zero temperature operation like LEDs instead of LCD and most gear needs to be operated with gloved hands. Peter brought along some examples of the equipment used and the members were most impressed with a 50 watt HF rig manufactured in WA that was the size of a paperback novel. An entertaining and informative talk.

The Hobart digipeater located on the Queen's Domain has been resurrected and is up and going again. VK7RAD, can be found on 147.575 MHz and supports

many packet protocols including FlexNet. It has been nearly two years since this digipeater has been heard in the Hobart area so dig out those dusty packet TNCs and try to remember those packet commands again.

### Tasmanian Nets

Just a reminder about the Tasmanian Nets:

#### Tassie Devil

On Tuesday nights at 1930 (local Tasmanian time) on 3.59 MHz LSB there is a friendly gathering of amateurs including some Tasmanians who are available to make contact with to gain points toward the Tassie Devil award.

#### Sewing Circle

At 1700 (local Tasmanian time) each day on 3.59 MHz LSB there is a friendly gathering of amateurs from a number of States that have a general rag-chew session about anything and everything. The Sewing Circle also get together each year near Christmas for a social gathering.

#### CHARCT Quiz Net

The Central Highlands Amateur Radio Club of Tasmania run a quiz net on Thursday night on 3.595 MHz LSB at 2000 (local Tasmanian time). This quiz net involves a quizmaster asking a range of questions with each person contributing an answer. A tally of correct answers determines the winner, who then runs the quiz for the next week.

So here's your invitation from Tassie to join in our nets and earn yourself some valuable points toward that Tassie Devil award! All suitably licenced amateurs are welcome.

73, Justin Giles-Clark, VK7TW

### Errata

In June 2003 AR in VK7 News - the name of VK7DM is incorrect. The correct name is Dave Marsland not Dave Marsden.

# How's DX?

Ross Christie, VK3WAC

19 Browns Road, Montrose 3765, Vic Email vk3wac@aol.com

## Amateur access to 60 metres?

The ARRL has announced that US amateurs will have access to five channels on the new 'experimental' 60 metre band from 3<sup>rd</sup> July. They are 2.8 kHz wide, with centre frequencies of 5332, 5348, 5368, 5373 and 5405 kHz. The RSGB in the UK is also running a similar experiment on 60 metre and there are rumours that German amateurs are lobbying for similar access. Many countries have allocated band space at LF (136 kHz and 73 kHz). Perhaps we Australian amateurs should be lobbying the ACA for similar access to both the 60 metre band and perhaps 136kHz in VK. The only other services (that I am aware of) that operate at these low frequencies are the regional airport LF beacons, but surely we can find a 'spare' channel between these stations for use by amateurs?

### The DX

**3D, SWAZILAND.** Dave, K4SV is heading to Swaziland and will operate as 3DA0SV beginning on the 29<sup>th</sup> of July until the 3<sup>rd</sup> of August. He will be taking along an Acom amplifier, just to make sure that he gets out! QSL via K4SV. (TNX K4SV and The Daily DX)

**3V, TUNISIA.** Francois, F8DVD will be visiting Djerba Island (AF-083) and will be active using the Djerba Scouts Radio Club callsign 3V8SM. He will be on HF using SSB only from the 23<sup>rd</sup> of June until the 4<sup>th</sup> of July. QSL via the bureau to F8DVD, or direct to Francois Bergez, 6 rue Liberté, 71000 Macon, France. (TNX VA3RJ and 425 DX News)

**4W, TIMOR LESTE.** Peter, G3WQU, is currently working in Dili, Timor-Leste (East Timor) and will be there at least until October 2004. He has been issued the callsign 4W3CW and runs 100 watt to multiband dipole covering 80 - 10 metre. QSL via his 4W3CW call book address to Peter McKay, UNMISET, PO Box 2436, Darwin, NT 0801, AUSTRALIA. (TNX G3WQU and The Daily DX)

**5W, SAMOA and KH8, AMERICAN SAMOA.** Ulli, DL2AH is heading to the Pacific Ocean for a holiday and is planning some HF activity while

travelling. He hopes to operate as 5W0AH, Samoa, from the 3<sup>rd</sup> until the 15<sup>th</sup> of July and then from American Samoa (no callsign details) from the 27<sup>th</sup> until the 23<sup>rd</sup> of July. He will be using a FT897 and a GAP Titan vertical antenna. QSL via DL2AH. (TNX DL2AH and 425 DX News)

**7P, LESOTHO.** A group of North American amateurs, K5LBU (7P8CF), WW5L (7P8TA), W5MJ (7P8MJ) and VA7DX (7P8NK), will be operating from Lesotho over the period of 18<sup>th</sup> until 25<sup>th</sup> July. The team will operate on the HF bands only using SSB, CW, PSK31, and RTTY. If all goes to plan they will have at least one station operating 24 hours a day QSL the 7P8 calls via the respective home call. (TNX NG3K)

**9A, CROATIA.** Feco, HA8KW will be operating as 9A/HA8KW/P from Prvic Island (EU-170) over 24<sup>th</sup> until 31<sup>st</sup> July. He will mainly use CW but will try SSB if he gets the chance. Feco will also enter the IOTA contest. QSL to HA8KW either direct (CBA) or via the bureau. (TNX HA8KW and 425 DX News)

**CY9, SAINT PAUL ISLAND.** A group of American hams (K5AAH, K5AB, KO4RR, N0RN, N5VL) and a Canadian (VE7SV) will be signing as CY9A from St Paul Island (NA-094) over the period of the 24<sup>th</sup> of July until the 2<sup>nd</sup> of August. They plan to be active on all bands 160 - 6 metre using CW, SSB and digital modes. The group will be taking amplifiers, yagis and a few multiband verticals along. The seawater ground plane for the verticals should help give them a low angle of radiation. QSL via N5VL. (TNX N5VL and 425 DX News)

**GM, SCOTLAND.** A group of GM operators will be on the island of Benbecula (EU 010) in the Outer Hebrides on the North East coast of Scotland on the 26<sup>th</sup> and 27<sup>th</sup> of July. The team will comprise John, MM0CCC; Robert, MM0ANT; Colin, GM0CLN; Ian, GM4ZRR and Keith, M0FZM. QSL via MM0ANT. (TNX MM0CCC and The Daily DX)

**150, MADDALENA and CAPRERA ISLANDS.** Luigi, IZ5FKK will be active as IM0/IZ5FKK from the islands of

Maddalena (EU 041) and Caprera (EU-041) over the period of the 10<sup>th</sup> until the 18<sup>th</sup> of July. Luigi says he will try to operate on as many HF bands as he can plus 6 m and 2 m. QSL via IZ5FKK. (TNX IZ5FKK and 425 DX News)

**J3, GRENADA.** W4/G4BK1, has moved home to Grenada. He says he will operate for a 12 month period as J3/G4BK1 before he obtains a full J38 callsign. He is mainly active on 20 and 15 metre CW. (TNX G4BK1 and 425 DX News)

**JW, SVALBARD.** Terje, LA3OHA is organizing a second expedition to Prins Karls Forland (EU-063) and is on the look out for operators. The Expedition is scheduled to take place between 11<sup>th</sup> and the 25<sup>th</sup> of July. If you are interested have a look at <http://www.dxpeditio.org/dxjwpk> for further information. (TNX LA3OHA and 425 DX News)

**KL, ALASKA.** Lanny, W5BOS and Don, N5XC will be signing as W5BOS/AL5 and N5XC/KL6 from Walrus Island (NA-121), Alaska. The pair will be running stations on most HF bands using SSB and CW beginning at approximately 0200z on the 15<sup>th</sup> of July until 1500z on the 17<sup>th</sup>. QSL via the respective home calls. (TNX W5BOS and 425 DX News)

**SV, GREECE.** Petros, SV3FUO is visiting the Skopelos Islands (EU-072). Greece and plans to be active on 80 - 10 metre, plus 6 m, as SY8FUO. He will be on the islands from the 1<sup>st</sup> until the 10<sup>th</sup> of July. QSL via SV3FUO. (TNX SV3FUO and 425 DX News)

**VQ9, CHAGOS ISLAND.** Larry, VQ9LA, has been very active recently on 20 metre RTTY. Have a listen around 14083-14090 kHz at 2200Z. Larry says that he will be there for about year. (TNX VQ9LA and OPDX)

**5H, TANZANIA.** Ramesh, VU2RKS is a YL operator who is currently active on 20 and 15 metre as 5H9KR from Mwanza in Tanzania. She prefers QSL cards to be sent direct to her via her call book address, which is Ramesh Krishnan, 4/1 'Madans' 3rd Seaward Road, Velmiki Nagar, Chennai 600041, India. (TNX VU2RKS and The Daily DX)

## Special Events

**V18, AUSTRALIA.** The Darwin Amateur Radio Club will be operating a special event station with the callsign V18NT to celebrate the Territory's 25 years of self government. V18NT will be officially opened on 1<sup>st</sup> July and will run until 31<sup>st</sup> Dec 2003. The callsign will be aired by a number of VK8 amateurs, but only one may put it to air at any one time. Many amateurs lined up to operate the station on all bands and modes, and V18NT will be entered in all major contests until the end of the year. Special QSL cards are being printed by Neil Penfold (who is also the QSL manager) and all QSLs will be welcome either direct or via the bureau.

**SP, POLAND.** The Polish special event station HF25KVV will be on air until the 25<sup>th</sup> of July to celebrate the 25<sup>th</sup> anniversary of the Polish club station SP5KVV situated in the city of Ostroleka. QSL to SP5KVV via the bureau. (TNX ARRL)

**UA, RUSSIA.** Vlad, UA1RG and a group of operators from Radio Club Vologda are planning to be active as RIPQ from Novaya Zemlya (EU-035). The team will have two separate stations operating for approximately ten days sometime between the 15<sup>th</sup> of July and the 15<sup>th</sup> of August. No QSL route was mentioned but perhaps details will emerge later. Novaya Zemlya is located in the Arctic Sea north of Siberia and was one of the old Soviet Unions nuclear weapons testing ground. I hope the equipment (and the operators) will be well screened from the harsh weather and environment, hi! (TNX UA1RJ and 425 DX News)

**EN, UKRAINE.** The special event callsign EN720K will be on air until the 15<sup>th</sup> of July to celebrate the 720<sup>th</sup> Anniversary of the city of Rivne. The station operators will be Paul, UT1KY; Igor, UR5KCE and Taras, UR5KDX. QSL direct via Massimo Balsamo (IK1GPG), Strada Statale 28 Nord No. 7, I-12084 Mondovì (Cuneo), ITALY. All QSLs will be automatically returned via the Bureau. (TNX IK1GPG and The Daily DX)

**W, USA.** A special event station, W1T, will be on air from 5<sup>th</sup> until 27<sup>th</sup> July. The operators will be WA2VUY and K2MVW. The station is to commemorate the 100<sup>th</sup> anniversary of the bicycle marathon the 'Tour de France'. Special QSL cards are being printed that bear a

photograph of 21 of the 22 surviving Tour de France champions (taken on the 24<sup>th</sup> of Oct 2002). QSL via WA2VUY. (TNX WA2VUY and OPDX)

**YB, INDONESIA.** The Indonesian special event station YB35AR will be on air to celebrate the 35<sup>th</sup> Anniversary of ORARI (Organisasi Amatir Radio Indonesia, 1968 - 2003). The station will be on air from Jakarta from 6<sup>th</sup> until 13<sup>th</sup> July. A group of Indonesian amateurs will be operating the station on all HF bands, including WARC, and 6 metre plus AO40. Modes will include CW, SSB, RTTY, SSTV and PSK31. QSL via the YB QSL bureau or direct to P.O. Box 8000, Jakarta 11000, Indonesia. Also, the ORARI headquarters station YE0HQ will take part in the IARU World Radio Championship over 12<sup>th</sup> and 13<sup>th</sup> July. (TNX The Daily DX)

A series of special memorial operation will be taking place in the coming months to commemorate Ignacy Lukaszewicz who was a Polish petroleum pioneer. Ignacy first distilled crude oil and designed kerosene lamps to light up the operating theatre in the Lvov hospital on 31<sup>st</sup> July 1853. He is the founder of the Polish petroleum industry and in 1854 is quoted as saying that "this lotion is the future wealth of this country, it's the welfare and prosperity for its inhabitants, it's a new source of income for the poor people and a new branch of industry, which shall bear plentiful fruits." Look for the following special event stations:

HF150L July 1st-August 15<sup>th</sup> QSL via SP8PJG.  
320IL July 25th-August 4<sup>th</sup>, QSL via SP8ZBX  
3N0IL July 25th-August 4<sup>th</sup>, QSL via SP8PEE  
EN3WLL July 25th-August 4<sup>th</sup>, QSL via UR4WXX  
HF8IL Aug 20th- Sept 10<sup>th</sup> QSL via SP8PJG

## Expeditions

**VK9XYL.** A short note from Gwen, VK3DYL, to let us know of a change in their plans for their VK9XYL Expedition later this year. Due to unavoidable airline schedule changes the operation from Christmas Island as VK9XYL will now take place from 13<sup>th</sup> until 27<sup>th</sup> Oct. The VK9CYL operation will now take place from 27<sup>th</sup> Oct until the 10<sup>th</sup> of Nov. This effectively shortens their overall time on air from Christmas Island but Gwen says the changes were unavoidable and totally beyond their control. The QSL route for both calls is still via VK3DYL.

**A25, BOTSWANA and 7P8,**

**LESOTHO.** "The African Double Jump" is the name being given to the Dxpdition being organised by Joe, AA4NN; Mauro, IN3QBR and Fabrizio, IN3ZNR. The team are planning to operate from Botswana and Lesotho in early July. Their first stop will be South Africa where they will join up with Andre, ZS6WPX and if the opportunity arises they might put in some time on air from ZS. The guys will then head to Botswana for the first part of their "double jump" and plan to be on air from 2<sup>nd</sup> until 6<sup>th</sup> July using the calls A25NN and A25ZNR. There next stop will be Lesotho where they will be on air with the calls 7P8JB and 7P8NR from 7<sup>th</sup> until 12<sup>th</sup> July. Joe, AA4NN may travel to Mozambique afterwards, no mention whether he plans to operate from here though. No details of a QSL route as yet, but work them if you get the chance as a route will no doubt appear. (TNX AA4NN and The Daily DX)

**FP, MIQUELON.** Paul, FP/K9OT and Peg, FP/K9LIE are planning another (their third) annual low-power DX vacation to Miquelon (NA-032). The pair will be there from 27<sup>th</sup> July until 5<sup>th</sup> August. They will operate CW and SSB and concentrate on the 160, 80, 40, 30, 17, 12 and 10 metre bands. As this is a low power 'DX vacation' special preference will be given to stations signing /QRP, mobile or portable, and Asian and Oceanian stations. QSL via home calls either direct or through the bureau. (TNX K9OT and 425 DX News)

**VP2, MONTSEERAT.** Three members of the Florida Dxpdition Group, Bill W4WX (VP2MHX), William, N2WB and Bob, K9MD0 (who are both waiting on their individual VP2M callsigns) will be there from 22<sup>nd</sup> until 29<sup>th</sup> July. Their equipment will comprise three Kenwood TS-570D's and will be active on most bands and modes. Bill says that this is a "little warm up for an upcoming San Andres trip in October". QSL via their home callsigns via the bureau or direct to their CBA address's. (QSL N2WB via his QSL Manager N2OO). (TNX W4WX and OPDX)

**7P, LESOTHO.** The planned Dxpdition to Lesotho from the 18<sup>th</sup> until the 25<sup>th</sup> of July will comprise Charles, K5LBU (7P8CF), Madison, W5MJ (7P8MJ), Neil, VA7DX (7P8NK), Tom, WW5L (7P8TA), Dave, K4SV (7P8DA) and Igor, WO1R (7P8IZ). This will be comprehensive all mode, all band

operation, 160 – 10 metre, with a good selection of equipment, including beams, dipoles and a couple of amplifiers. They also plan on keeping at least one station on air 24 hours a day. Charles, 7P8CF and Tom, 7P8TA will be the teams main SSB operators while Madison, 7P8MJ; Neil, 7P8NK; Dave, 7P8DA and Igor, 7P8IZ will be concentrate on the CW and digital modes. The DXpedition is operating under the banner of the Texas DX Society (<http://www.tdxs.net/>) and the Lone Star DX Association (<http://www.lsxer.org/lstdxa>). QSL via each operator's home call. 7P8CF via K5LBU, 7P8TA via WW5L, 7P8MJ via W5MJ, 7P8NK via V4DX, 7P8DA via K4SV and 7P8IZ via W0IZ. (TNX WW5L)

## Round up

**V15WCP.** Peter, VK3QI reports that the recent V15WCP operation from from Waldegrave Island (OC-261) was on the air for 110 hours and logged 6698 QSOs (4326 SSB and 2372 CW). Most of the contacts were made on 20 m SSB (2709) and 30 m CW (1165). The continent breakdowns are Europe/2727, Asia/2086, North America/1431, Oceania/411, Africa/23 and South America/20. (TNX VK3QI and 425 DX News)

**Stuie, VK8NSB.** has been busy on the air and as you can see below he has been burning the 'midnight oil' to good effect.

Station	Date	Freq. kHz	UTC
M3XWZ (IOTA EU-005)	26 Apr 03	21285	1433
K85GL / S (IOTA NA-089)	26 Apr 03	21280	14.50utc
IBDDX - (IOTA EU-045)	26 Apr 03	21282	15.02utc
ID9RGE (IOTA EU-017)	26 Apr 03	21260	16.28utc

Bill Moore, NC1L, of the ARRL's DXCC office has confirmed that the following YI (Iraq) stations are acceptable for DXCC credits. YI/ON6TT, YI/SM7PKK, YI/553R, YI/557CQ, YI/55ORF, YI/ON4WW, YI/VK4KMT, YI/EK6KB, YI/EK6DO and YI/ON5NT. Remember, work them first and worry later!

East Timor could be off the air for a short while. Thor Stefansson, 4W6MM, says that amateur operations is well and truly QRT, at least for him. After a staff change at the U.N. headquarters in New York an official has dispatched a message saying that "since the 'UNTAET' organisation's charter in East Timor expired on 20<sup>th</sup> May 2002, all ham radio operating authority also expired on that date". The successor organisation,

'UNMISSET' does not have the same telecommunications authority to grant permission for amateur radio operations. The emerging East Timor government will eventually assume administrative responsibility for licensing (including amateur radio licensing).

Another short note from Thor that appeared in The Daily DX reads "Previous operations from East Timor with the 4W callsign prefix were under a United Nations provision allowing authorization and administration of ham radio operations by the United Nations 'during clearly defined transitional periods in the absence of a national government'. That period officially ended, according to UN officials, on May 20<sup>th</sup>, 2002. Consequently, all valid operations from East Timor now appear to have been limited to between March 1, 2000 and May 20, 2002. Since that date, licences apparently have to be issued by the newly created Ministry of Transports and Communications in East Timor, led by that bureau's minister, Dr. Joao Carrascalao. Apparently no licences have yet been issued by Dr. Carrascalao. Thor says East Timor now has its own telephone country code which leads him to speculate that it now has ITU status and "a callsign allocation is only a formality away."

There is a new **Antarctica Net running on 14300 kHz on Saturdays at 1900Z.** The net controller is LU4DXU who has been busy policing the stations queuing up for an Antarctic QSO. Recently, LU1Z (Esperanza Base) and DP1POL have put in appearances. (TNX LU4DXU and 425 DX News).

Roger, VK3FRS, has passed on a short note saying that the electronic 'log of the world' (LOTW) project has just released the software for beta testing. This electronic form of QSLing looks like it may well become the defacto QSL method for DXpeditioners and DX stations, and probably many others too. For more details, and a free download of the required software, visit their website at <http://www.arrl.org/lotw/>

The cost of maintenance, and falling passenger numbers, has made this history-making Concorde supersonic airliner uneconomical to run. The British Airways Concorde is scheduled for its last flight sometime in September, but by the time these notes are published the Air France Concorde will have flown for the last time across the Atlantic from

New York to Paris. The special event station TM5SC, operated by Jerome F5ASD, was on the air from 25<sup>th</sup> May until 8<sup>th</sup> June to commemorate this last flight. If you were lucky enough to have worked TM5SC then the QSL route is via F5ASD either via the bureau or direct. (TNX F5ASD and 425 DX News)

I should not have to remind many that 6<sup>th</sup> June was the anniversary of D-Day. A number of special event stations were on air to mark the 50<sup>th</sup> Anniversary of the allied forces invasion of Europe.

TM6JUN, was on air using SSB and CW from 1<sup>st</sup> until 9<sup>th</sup> June. QSL via F5RJM either via the bureau or direct if you managed a QSO. (TNX F5NQL and 425 DX News)

TM6SME was also on the air, again using SSB and CW, from Sainte Mere Eglise from 6<sup>th</sup> until 20<sup>th</sup> June. QSL via F6IPS either via the bureau or direct for this one. (TNX F5NQL and 425 DX News)

F/ON6JUN/P was operating on all HF bands and 6 metre from Ranville, France over the period of 5<sup>th</sup> until 7<sup>th</sup> June. If you managed to work this station then QSL via ON6BV either via the bureau or direct. (TNX ON5SD and 425 DX News)

A recent example of using the newest mobile phone technology for amateur radio is a new Internet site set-up for those of us who own a 'camphone' (yes a mobile phone with a built in digital camera). If you have one you might be interested in a new experimental website organised by the 425 DX News team. Take a picture of your shack, DXpedition, hamfest, contest stations etc (and adding your name and callsign) simply email your image (in JPG format) to [425.dxn@tamw.com](mailto:425.dxn@tamw.com). Your picture, and many others, can be viewed at the following website, <http://425.textamerica.com>

Quite a large bag of interesting stations on air this month, and our thanks go to the following individuals and organisations for the information. ON5SD, F5NQL, F5ASD, VK3FRS, LU4DXU, 4W6MM, NC1L, VK8NSB, VK3QI, WW5L, W4WX, K9OT, AA4NN, VK3DYL, WA2VUY, IK1GPG, UA1RJ, VU2RKS, VQ9LA, SV3FUO, W5BOS, LA3OHA, 4GBKI, IZ5FKK, MM0CCC, N5VL, HA8KW, NG3K, DL2AH, G3WQU, VA3RJ, K4SV, ARRL, The RSCB, The Daily DX, OPDX (BARF 80) and 425 DX News



## Part 27 – Home Brew Computers

Not so long ago, if Radio Amateurs wanted to go on air, the only solution was to modify surplus equipment or start from scratch and build a rig. Today, few RAs would even consider home brew because the majority of essential radio components are no longer stocked in popular 'enthusiast stores'. There's plenty of commercial RA equipment, both new and secondhand at agreeable prices for shallow pockets. However, building a new computer today is but a small fraction of the cost for a new HF/VHF transceiver – with no need of soldering iron or to shop around for components. It takes just one hour to assemble a new computer ready for your Ham Shack. All the new digital modes will be at your fingertips.

### Start a Wish List

Write a wish list of what you'd like the new computer to actually do in the shack – like packet radio, PSK31 and other fuzzy modes, logging, databases, word processing and station control tasks etc. Some readers might already have digital cameras, modems, colour printers, and need to upgrade. Others might want to start from scratch. The list will point to the criteria for the computer specification. Tease out essential information that lists the requirements. One example being those modern transceivers has serial ports ready for computer control. Sound cards and CD-ROM drives are essential for fuzzy modes, and loading software.

### The Motherboard

Use popular magazine adverts (2) as a guide to prices and to check the current motherboard offerings for the number of PCI slots, serial ports, printer port, USB sockets, ethernet access, internal audio and graphics capabilities etc. Two types will emerge, those intended for Intel processors like the Celeron and Pentium 4 devices. Others are designed for Duron and Athlon processors developed by AMD.

There are dozens of motherboards on the market from much less than \$200 through to \$1,000 or more. A typical 'budget' computer might end up with an Intel Celeron 1.7-GB processor and motherboard with integrated sound, graphics display, two serial ports for the rig and TNC etc, and one parallel

port for the printer and automatic CW keying. Look for ATX or mini ATX style boards with PS2 mouse and keyboard connections – and USB 2 sockets. If you

intend running two or more computers on a home network – an ethernet port as well. In addition, look for motherboards with at least three PCI (white) slots for easy expansion like polling serial port cards. Once this research has been completed, the hard part has been done.

### A Parts List

Start with a good ATX case. A mid-tower is preferred for placement under the shack bench out of the way. Avoid desktop cases with the monitor perched on top. The operating ergonomics are obvious because your eyeline will do gymnastics trying to see the screen, operate the rig and entering data on the keyboard! So, the case disappears under the bench for convenience. Look for cases with a 300-Watt internal power supply, three 5-inch, and one 3 1/2-inch floppy drive slot. Avoid cases where the top and side cover has to be removed in one piece. Tight fitting separate sides with interlocking slots are preferred, especially when good RF grounding is needed in a Ham Shack. All the interconnecting colour-coded leads come with modern cases at less than \$100 for a decent case.

Top end processors are always expensive, so look for AMD or Pentium 4's with a speed of around 1.7-2.5-GB. Hard drives start at 40-GB these days, and are fairly cheap to buy. Less than \$150 will buy a nice Seagate or Maxtor running at 7,200-RPM with the grunt in a busy AR environment.

DDR Memory comes in single plug-in strips with 256-MB or 512-MB if you can afford the extra for around the \$100 mark for keen shoppers. AOpen sell first class 52X-CD-ROM drives for about \$50, or

upgrade to a CD-R/W (read/write) drive below \$100 is worth considering. This makes backups and CD-ROM copies a breeze. Avoid "el-cheapo's" from emporiums that cost less, with unknown brand names otherwise it will cost big money in the long term. A good Panasonic floppy drive, generic Windows keyboard and a wheel mouse together with a nice flat-screen 17" digital monitor – all up will cost less than \$1,000 for the lot. Use this as your target price, then make the Parts List from several columns of options like:

1. Intel Pentium 4 1.8-GB or better.
2. The AMD equivalent
3. Lower priced Celeron, or a ...
4. Duron from AMD

Once the shopping list has been finalised, check the list with an experienced friend and seek their advice. Be prepared to make small changes here and there, and add those changes to the options. Don't forget why you have to do this – it's all got to work well in your Ham Shack the first time. Failure to plan means planning to fail. Never walk into a computer store and seek their advice, they'll try to sell you what they want to get rid of!

**Details of the  
UK  
Foundation  
Licence  
available on video**

See VK2 notes for  
Details – page 34

## The Pitfalls

1. Motherboards come in dozens of flavours. Some modern boards lack serial ports, printer ports, have just one PCI slot, use obsolete RAM, don't have USB 2 sockets etc. Others include firewire sockets, multi-channel surround sound, and other non-essential AR features. Many AR related devices wouldn't connect to these boards, so take care with your selection. A fully integrated system might need six serial ports for the AR equipment, USB for printer and digital camera, and an 10/100 ethernet connection for your network – it all depends upon your requirements. It's nice to have all the port options just in case you need to upgrade/change peripherals. It can cost you more to add PCI-serial adaptor cards only to find you've not enough slots for the additions!
2. Include a mobile rack allowing speedy hard drive(s) removal.
3. Choose a hard drive that runs at 7,200-RPM for extra speed.
4. To allow easy experimentation, opt for a front case access panel for audio, serial and USB ports. If you are developing digital devices etc, this is a nice feature to have.
5. A rear two-serial motherboard with PS2 keyboard and mouse access gives you three serial ports!
6. Include an extra EIDE cable ready to add a secondary hard drive later.
7. Always include a mains power surge protection board with extra sockets for modems, scanners, printers, and the like.
8. If your chosen case lacks side panel, front, and rear ventilation holes – choose another case! Make sure your new computer runs cool!

## Tools, Odds and Ends

1. Screwdrivers with crosshead and flats in various sizes
2. Anti-static wrist strap earthed via the computer case. The power cord should be connected to an earthed power outlet – with the power SWITCHED OFF! Alternatively, firmly ground the case to the station earth terminal.

3. Small selection of black plastic cable zip up straps to tidy up the computer Innards when finished. Ensure internal cables don't inhibit airflow and ventilation.
4. Off-cut of carpet (a \$1 carpet shop sample) to protect the shack workbench and the new computer while assembly is proceeding.

## Assembly Time

Start by fitting the processor and RAM to the motherboard, then the motherboard into the case. Connect the power supply, front LED's reset and power switch leads to the motherboard. The colour coded leads should be easy to follow from the motherboard layout documentation.

Add the mobile rack and hard drive assembly into the lowest of the 5-1/4" drive bays. Next, the CD-ROM drive which goes into the upper bay, and then the floppy drive to the 3-1/2" bay. Make sure that the hard drive has the link in the 'master' position, then connect the primary EIDE socket to the hard drive with the supplied ribbon cable. Use the secondary EIDE slot for the CD-ROM (that's the extra cable mentioned before), and add the audio cable between the CD drive and the motherboard. If you run both drives from a single primary EIDE socket, the new computer will be sluggish.

Assembly should be straightforward. Double-check everything, don't over tighten screws, turn the case around to make sure nothing drops out like rogue screws etc! Connect the monitor, keyboard and mouse and you're ready to power-up and test your creation.

## Software

A boot-up floppy disk is essential. It should preferably have DOS command com, format.exe, and other disk tools to startup your computer.

Switch on and watch the screen for the BIOS setup by selecting the Delete key when prompted. Set the BIOS recommended by the motherboard manufacturer. Choose the boot up sequence as A-CD C. Save the settings and reboot again with the boot floppy in drive A: The A:\ prompt should be seen ready to format C:\ and to prepare the hard drive.

Your new computer is ready to load your software starting with the operating system (OS) such as Windows 98SE/ME/

XP or Linux as your preferred system. Once the OS has been checked, applications software can be added one by one.

## Completion

Assembling the new computer from scratch should take less than one hour, and adding the OS might take another 45 minutes. However, the applications, Internet, printer and modem drivers, rig control etc might take several days of spare time – depending upon desired options. It all depends upon your own expertise and experience. For readers trying this for the first time, **don't panic!** Follow the instructions in the motherboard handbook, don't rush things, never force plugs into sockets, and slowly follow the colour-coded connections. These days, motherboards are "Jumper-less", and devices are all Plug-and-Play

## Summary

This article briefly describes how to build a computer in less than one evening in the shack. For experienced readers – it's easy and fun to do. However, for assertive newcomers to computing, some light bedtime reading about *Ham Shack Computers* (1) from this series will give you all the information needed to do the job. Much had to be abbreviated due to lack of space in this publication – and the writer makes no apology except to offer motivation to readers who are prepared to take-up the challenge and save money by doing so.

Don't you think it's tempting to end up with a fully computerised Amateur Radio Station that will be the envy of any visitor? Just watching things happen is exciting, but making things happen should be your quest as it puts the fun back into Amateur Radio.

**Ham Tip No. 27.** Always keep a boot-up floppy disk handy with ScanDisk, Defragmenter, and format.com files ready to diagnose hard drive problems

**Ham Shack Computers, Part 28** – next month highlights common FAQ's from this series sent in by readers

1. Ham Shack Computers Web [www2.tpg.com.au/users/vk6fp](http://www2.tpg.com.au/users/vk6fp)
2. "Putting it all together" in APC Magazine April 2003 pp.124-129 ISSN 0725 4415

73's de Alan, VK6PG



## Calendar July - September, 2003

Jul 5	Jack Files Contest	(CW/SSB/PSK31)	(May 03)
Jul 5	NZART Memorial Contest	(CW/SSB)	
Jul 5/6	Original QRP Contest	(CW)	
Jul 12/13	IARU World Championship	(CW/SSB)	
Jul 19	Pacific 160 Metres Contest	(CW/SSB)	(Jun 03)
Jul 19	Colombian Independence Day Contest	(CW/SSB/RTTY)	
Jul 26/27	Russian RTTY Contest		
Jul 26/27	Venezuelan Independence Day Contest	(CW)	
Jul 26	Waitakere Sprint	(SSB)	
Aug 2	Waitakere Sprint	(CW)	
Aug 9/10	Worked All Europe DX Contest	(CW)	
Aug 16/17	RD Contest	(CW/SSB/FM)	(Jul 03)
Aug 16/17	Keymen's Club of Japan Contest	(CW)	
Aug 23/24	TOEC WW Grid Contest	(CW)	
Aug 30/31	SCC RTTY Championship		
Aug 30/31	YO DX HF Contest	(CW/SSB)	
Aug 30/31	ALARA Contest		(Jun 03)
Sep 6/7	All Asian DX Contest	(SSB)	
Sep 13/14	Worked All Europe DX Contest	(SSB)	
Sep 27/28	CQ/RJ WW RTTY Contest		

## Results Harry Angel Sprint 2003

### CW Section

1. VK5NJ	John	72 points
2. VK5XE	Ian	30
3. VK2MQX	Chris	22
4. VK2QF	Neville	20
5. VK2ANZ	Neville	18

### SSB Section

1. VK5SR	S.E.R.G.	62 points
2. VK3IO	Ron.	54
3. VK4YZ	Charlie	41
4. VK2LCD	Chris.	34
5. VK2AKB	Karen	33
6. VK7JGD	Garry	32
7. VK2JAH	Laurie	30
8. VK5AIM	Steve	25
9. VK2JHN	Walter	13

### MIXED MODES Section

1. VK3JS	Ian	74 points
2. VK4SN	Alan	54
3. VK8AV	Alan	44
4. VK1AI	Greg.	32
5. VK5UE	Col.	16

## Comments

A total of 19 logs received this year. Participation was good and band conditions quite favourable. Sincere thanks to you all for your efforts.

Several people commented about this event coming at the end of a very long day for those of us who have been

involved in Dawn Services and other ANZAC Day activities.

Suggestions have been made that the event needs to be either earlier in the night, on the Saturday nearest ANZAC Day, or at a different time of the year. Any comments on these ideas will be much appreciated.

73, Ian Godsil VK3VP, Contest Manager

## Waitakere Sprints 2003

The Western Suburbs Radio Club is pleased to announce that the Waitakere Phone Sprint will be held on Saturday July 26<sup>th</sup> 2003 and the CW Sprint will be on Saturday August 2<sup>nd</sup> 2003

The contests are of one-hour duration on 80m, and are open to all licensed amateurs in ZL, VK and Oceania call areas.

### Object of the Sprints

The operator's basic goal in the sprints is to make as many contacts as possible, without duplication, during an hour of operation on a single band. Any contact with ZL, VK or Oceania stations on 80 during the contest period can be counted, but a station may be claimed only once.

### Eligibility

The Waitakere Sprints are open to all licensed amateurs anywhere in the ZL, VK and Oceania call areas. SWL logs will also be welcome.

### Contest Periods

Phone: 1000 to 1100 UTC, on July 26<sup>th</sup> 2003

CW: 1000 to 1100 UTC, on Aug 2<sup>nd</sup> 2003

### Frequencies

Phone: Frequencies between 3 550 to 3.700 may be used.

CW: Frequencies between 3 500 to 3.550 may be used.

*Continued on page 43*

# 2003 Remembrance Day Contest

16/17 August 0800z Sat - 0759z Sun

Presented by Alek Petkovic VK6APK

**Purpose:** This contest commemorates the amateurs who died during WWII and is designed to encourage friendly participation and help improve the operating skills of participants. It is held close to 15 August, the date when hostilities ceased in the south-west Pacific area.

It is preceded by a short opening address by a notable personality transmitted on various WIA frequencies during the 15 minutes prior to the contest. During this ceremony, a roll call of amateurs who paid the supreme sacrifice is read.

A perpetual trophy is awarded annually to the WIA Division with the best performance. The name of the winning Division is inscribed on the trophy, and that Division then holds the trophy for 12 months. The Division also is given a certificate, as are leading entrants.

**Objective:** Amateurs in each VK call area will endeavour to contact amateurs in other VK call areas, ZL and P2 on

**Bands:** 1.8 - 30 MHz (no WARC). On 50 MHz and above amateurs may also contact other amateurs in their own call area.

**Contest Period:** 0800 Z Saturday, 16 August to 07.59 Sunday, 17 August, 2003. As a mark of respect, stations are asked to observe 15 minutes silence prior to the start of the contest, during which the opening ceremony will be broadcast.

## Rules:

### 1. Categories:

- (a) High Frequency for operation on bands below 50 MHz;
- (b) Very High Frequency for operation on and above 50 MHz;
- (c) Single Operator;
- (d) Multi-operator;

### 2. Within each Category the \*Sections\* are:

- (a) Transmitting Phone (AM, FM, SSB, TV);
- (b) Transmitting CW (CW): Note: Digital modes such as Packet, RTTY, AMTOR, PSK31 etc are excluded from the contest.
- (c) Transmitting Open (a) and (b);
- (d) Receiving (a), (b) or (c).

### 3. All amateurs in Australia, Papua New Guinea and New Zealand may enter the contest, whether their stations are fixed, portable or mobile

### 4. Cross-band and cross-mode contacts are not permitted.

### 5. Call CQ RD, CQ CONTEST or CQ TEST

### 6. On bands up to 30 MHz stations may be contacted once per band using each mode, ie twice per band using CW and Phone. No points will be awarded for contacts between stations in the same call area on HF.

### 7. On 50 MHz and above, the same station in any call area may be worked using any of the modes listed at intervals of not less than two hours since the previous contact on that band and mode.

8a. Both single and multi-operator entries are permitted. To be eligible as a single operator, one person must perform all operating and logging activities without assistance, using his or her own callsign. More than one person can use the same station and remain a single operator providing that each uses his or her own callsign, submits a separate log under that callsign and does not receive operating or logging assistance in any way during the contest.

8b. Holders of more than one license or callsign may submit a separate entry for each callsign held.

9a. Multi-operator stations are only allowed one transmitter per band/mode at any one time. Simultaneous transmissions on different bands are permitted. Simultaneous transmissions on the same band but different modes are permitted.

9b. Automated operation is not permitted. The operator must have physical control of the station for each contact. CW and voice keyers are permitted, as is the use of computers for logging.

10. For a contact to be valid, numbers must be exchanged between stations making the contact. \*Exchange\* RS for phone and RST for CW, followed by three figures commencing at 001 and incrementing by one for each successive contact.

11. Contacts via repeater (including satellite) are not permitted for scoring purposes. Contacts may be arranged through a repeater. Operation on repeater frequencies in simplex is not permitted.

12. Score: on 160 m two points per completed valid contact; on all other bands one point; on CW double points.

13. Logs should be in the format shown below and accompanied by a Summary Sheet showing callsign; name; address; category; section; for multi-operator stations a list of the operators; total score; declaration: "I hereby certify that I have operated in accordance with the rules and spirit of the contest"; signed; date.

14. Entrants operating on both HF and VHF are requested to submit separate logs and summary sheets for both areas.

15. VK entrants temporarily operating outside their allocated call area, including those outside continental Australia as defined for DXCC, can elect to have their points credited to their home Division by making a statement to that effect on their summary sheet(s).

16. Send logs and summary sheets to: RD Contest Co-ordinator, A Petkovic VK6APK, 26 Freeman Way, Marmion, WA 6020, by Friday 19 September, 2003. Endorse envelope Remembrance Day Contest on front outside. Late entries will not be eligible.

17. Certificates will be awarded to the leading entrants in each section, both single and multi operator; in each Division; P2 and ZL. Entrants must make at least 10

contacts to be eligible for awards, unless otherwise decided by the Contest Manager

18. Any station observed as departing from the generally accepted codes of operating ethics may be disqualified.

## Determination of Winning Division:

Unless otherwise elected by the entrant concerned, the scores of VK0 stations will be credited to VK7, and the scores of VK9 to the mainland call area which is geographically closest. Scores of P2, ZL and SWL stations will not be included in these calculations.

For each Division, an improvement factor will be calculated as follows:

- (a) For transmitting logs only, HF and VHF Benchmarks for each Division will be established, against which its performance for the current year is judged. The same formula will be used for HF and VHF, inserting the appropriate figures:

$$B = 0.25P + 0.75L$$

where B = this years benchmark, P = last years total points, and L = last years benchmark.

- (b) For each Division, HF and VHF Improvement Factors will then be calculated. Once again the same formula will be used for both HF and VHF, inserting appropriate figures:  $I/F = \text{Total points (this year)} / \text{Benchmark}$  where  $I/F$  = improvement factor.

- (c) For each Division, the HF and VHF Improvement Factors will then be averaged.

$$\text{Overall } I/F = (\text{HF } I/F + \text{VHF } I/F) / 2$$

- (d) The Division which achieves the highest overall improvement factor will be declared the winner.

## 2003 Benchmarks

These are the total scores which must be obtained by each Division to improve on its results of last year:

Div	HF	VHF
VK1 615	189	
VK2 3950	132	
VK3 3246	5871	
VK4 3509	1302	
VK5/8	3572	1662
VK6 2390	4315	
VK7 1565	935	

## Receiving Section Rules

1. This section is open to all SWLs in Australia, Papua New Guinea and New Zealand. No active transmitting station may enter this section.
2. Rules are the same as for the Transmitting Section.
3. Only completed contacts may be logged, ie it is not permissible to log a station calling CQ.
4. The log should be in the format shown below.

## Examples of logs:

### Example Summary Sheet

#### Remembrance Day Contest 2003

**Call sign:** VK3VP  
**Name:** Ian Godsil  
**Address:** 363 Nepean Highway, Chelsea, 3196  
**Category:** HF/Single Operator  
**Section:** Transmitting CW  
**Total Score:** 1000  
**Declaration:** I hereby certify that I have operated in accordance with the rules and spirit of the Contest.

**Signed:** Ian Godsil **Date:** 30 August 2003

### Example Transmitting Log

#### Remembrance Day Contest 2003

**Call sign:** VK1XXX  
**Category:** HF/Multi Operator  
**Section:** Transmitting Phone

Time (UTC)	Band	Mode	Call	Nr	Nr	Pts
				Sent	Rcvd	
0801	14	SSB	VK2QQ	58001	59002	1
0802	14	SSB	VK6LL	59002	59001	1
0806	14	SSB	VK5ANW	59003	59001	1
0808	14	SSB	ZL2AGQ	56004	57004	1
0811	14	SSB	VK4XX	59005	59008	1

### Example Receiving Log

**Name/SWL Nr:** L33071

**Category:** HF

**Section:** Receiving Phone

Time (UTC)	Band	Mode	Calling	Calling	Nr	Nr	Pts
0801	14	SSB	VK1XXX	VK2QQ	58001	59002	1
0802	14	SSB	VK1XXX	VK6LL	59002	59001	1
0806	14	SSB	VK5ANW	VK1XXX	59001	59003	1
0809	14	SSB	VK7AL	VK2PS	59007	58010	1

# Port Macquarie field day results

## Results

2 m Talk-in WINNER= VK2BZC PAUL R/U= VK2BYJ-JEFF  
80 m One TX WINNER= VK2ZCM CRAIG R/U= VK2BI BRIAN  
2 m Two TX WINNER= VK2ZCM CRAIG R/U= VK2BYJ-JEFF  
10 m One TX WINNER= VK2ZW KIM R/U= VK2BI BRIAN  
2 metre Pedestrian  
WINNER= SARAH PIPER (Booral)  
R/U= VK2ZCM CRAIG  
Fox Hunt Champion  
VK2ZCM CRAIG(16 Points) R/U VK2BI BRIAN(7 Points)  
Best Presented Foxhunt Vehicle  
VK2DGT KEN

## Home Brew

VK2GD-ALAN

## Guessing Comps

No. of jelly babies VK2XXU-WILL  
Weight of box screws VK2URK-RODNEY  
What's inside bottle VK2DGT-KEN  
What's in kitchen box VK2TT-TREVOR

## Quiz

Ladies' X Word VK2HZV JUDY Ladies' Quiz ALISON of 2GJ  
Men's X Word VK2CLL LARRY Men's Quiz VK2CLL LARRY

## Men's Lucky Door

(\$50 DSE Voucher) VK2HOT-BRUCE

## Ladies' Lucky Door

1=(Basket Goodies) ROBYN, XYL of VK2DGT  
2=(Wardrobe Pack) XYL of VK2FA  
3=(Manicure Pack) P AM, XYL of VK2PE



## Major Raffle

1<sup>ST</sup> \$100 Big W VK2TSR GARRY  
(Sydney)  
2<sup>ND</sup> \$25 Dinners (Westport B/C) VK2DV SNOW  
3<sup>RD</sup> \$25 Dinners (Westport B/C) VK2FSH CHARLES  
4<sup>TH</sup> Wine Pack VK2CLL-LARRY

## Waltakere Sprints 2003

*Continued from page 41*

## Power

In fairness and consideration to others we request that NO LINEAR AMPLIFIERS be used in the contest.

## Contest call

CQ Sprint, CQ Test or CQ Contest.

## Exchanges

Minimum exchange for a valid contact will consist of a serial number, sent and received.

The serial numbers must start at 001 and increment by one for each contact made.

Note :: Time and signal reports are not required.

## Awards

Certificates will be awarded to the overall winner and to the best score in each ZL call area and to the best three scores from VK/Oceania. Other certificates may be awarded at the discretion of WSRG

## SPECIAL AWARDS

To encourage contestants to enter both Sprints we have decided to issue a Special Certificate to the entrant with the Highest combined score. The method of calculation will be: (Phone points + CW Points) x 2.

All logs received will be considered for this award. To qualify for the multiplied points each log must contain a minimum number of valid contacts.

ie Ten (10) for Phone, and Five (5) for CW.

## Logs

A separate log must be submitted for each Sprint and must be clearly marked PHONE or CW..

Contest logs must show for each contact:- Callsign of station worked, serial number sent, serial number received.

SWL logs must show both Callsigns in the QSO also both serial numbers.

Logs may be sent by Packet Radio please use three columns only with no commas or other delimiters. Any logs received by packet will be acknowledged by the same medium

Logs are to be in the hands of the contest manager:- ZL1BVK, Alex Learmond, 14 Takapu Street Henderson Auckland. 1208.

Packet to ZL1BVK @ ZL1AB.

Email zl1bvk@xtra.co.nz

No later than 1st September 2003

## Operator Information

Each log must show the following details.

Mode

Callsign

Name

Address

Operating area (eg ZL1, ZL2)

Total Number of contacts claimed

A declaration that the operator has abided by the rules and spirit of the contest

Any entry which is clearly in violation of the rules or spirit of this contest or which contains an excessive number of duplicate contacts (this does not refer to duplicates which have been indicated as such and are not claimed) may be disqualified. The decision of WSRG (Inc) in respect of interpretation of these rules, the granting of awards and disqualifications will be final and no correspondence will be entered into.

Alex H Learmond ZL1BVK Contest Manager WSRG

## Interference to AO-40 2.4GHz Downlink in Perth

Towards the end of May this year, Phil VK6APH informed the AMSAT bulletin board that an unusual form of interference had almost wiped out AO-40 operation in the Perth metropolitan area. Phil described it thus:

"You may not hear many VK6 hams on AO 40 for a while. Many of us are suffering from interference from some form of wide band data transmission centred on 2.4GHz. The signal covers much of the Perth metro area and is very strong. So strong in fact that it does not matter where you beam you can still hear it - mainly from reflections I expect. The signal, which runs continuously, sounds like a 100 Hz buzzing sound and has a bandwidth of about 4 MHz. Looking at the signal on a spectrum analyser it has a flat top and very steep sides. The signal started about 6 weeks ago and one suggestion is that it might be an image response of our S band down converters to the 2.1 GHz G3 mobile phone service that have just started tests".

Phil went on to say that he was

organising a DF party for the following weekend and that he would report his findings to the bulletin board. Indeed he did! Below is his latest bulletin on the subject:

"Many thanks to all those who replied to my recent posting regarding the widespread interference that many VK6 AO40 users are suffering. It turns out that the interference is due to the commencement of trials of the new 3G mobile phone services in Perth. There are a handful of such test sites over the metropolitan area, one being 1km from my QTH. The 3G services operate in the range 2 - 2.2 GHz which falls into the image response of our S-Band down converters when using a 2 m IF. There are a number of ways to overcome the problem. In the long term we are going to need converters with higher image rejection. The JAs, who have had the same problem for some time, are using interdigital filters to notch out the image frequencies. Rather than modify our down converters we could fit a high-pass, or notch, filter in front of the converter. Unfortunately, the filter will have some loss that will add directly to the overall system noise figure. A simpler alternative is to use high side local oscillator injection. This shifts the image response to 2.7

GHz, which hopefully will be interference free. High injection will mean the converter will invert the tuning direction, but this is a small inconvenience to be back on AO40. I'm working with Charlie, G3WDG, to test this solution with his make of down converter. Based on being 1km line-of-site from a 3G base transmitter it would appear that I need an additional 60 dB of image rejection. This should be quite achievable. A few VK6 operators did not report any interference despite having a 3G base station near by. It would appear that some makes of down converter already have acceptable levels of image rejection. It would be useful to make a table of the image response of converters and if you have the ability to measure yours then I would be happy to collate the results. An Australian manufacturer - [www.minikits.com.au](http://www.minikits.com.au) -, VK5EME, has already modified his design to meet the rejection figures required. As annoying as the interference is, at least it's not in-band and with suitable engineering it can be overcome. With the projected explosion in the use of 3G mobile phones this could be one problem that many of us will face in the future".

Thanks very much for the input, Phil.

### The AMSAT group in Australia

The National Co-ordinator of AMSAT-VK is Graham Ratcliff VK5AGR. No formal application is necessary for membership and no membership fees apply. Graham maintains an email mailing list for breaking news and such things as software releases. Members use the AMSAT-Australia HF net as a forum.

### AMSAT-Australia HF net

The net meets formally on the second Sunday evening of the month. In winter (end of March until the end of October) the net meets on 3.685 MHz at 1000utc with early check-ins at 0945utc. In summer (end of October until end of March) the net meets on 7.068 MHz at 0900utc with early check-ins at 0845utc. All communication regarding

AMSAT-Australia matters can be addressed to:

AMSAT-VK,  
9 Homer Rd,  
Clarence Park, SA. 5034  
Graham's email address is:  
[vk5agr@amsat.org](mailto:vk5agr@amsat.org)

### YACER (Yet Another Camera Experiment)

#### (Revisited) for Windows (Program Suite)

Package now available

**Gunther Meisse W8GSM recently posted this information on the AMSAT bulletin board.**

"For those of you interested in the AO-40 Spacecraft technology & Science, I am happy to announce the availability of the YACER Package. You can now capture, view, and analyze the YACE Camera Images and determine the spacecraft Alon/Alat directly from the telemetry beacon raw data stream, or from the AO-40 Archives. This Package includes all

the software and documentation of the software, used by the AO 40 Command Stations in their day to day ascertainment of the spacecraft Alon/Alat. Now you can do it yourself, in the shack. The package (YACER) is supplied as an auto extracting, zipped file containing file structure, the necessary data files to get started, the suite of software programs, the full 40

page documentation and User Manual, and a simple 'Readme.txt'. The documentation is supplied in .pdf format, so you must have Acrobat Reader. A word of caution. This package is not for the faint of heart. This documentation covers software written over the last two decades by some of the best minds in AMSAT, worldwide. We have attempted to make the documentation as friendly as possible, but you must be willing

to take the time to read it cover-to-cover prior to getting started. Take your time with it, and you will have a BALL!!! The YACER Package is distributed at no charge. If you like it and use it, why not send a reasonable contribution (say \$20.00) to your AMSAT organization. More money = more birds!"

A week or so after this announcement Gunther followed up with this bulletin: "I am pleased to announce that the Revised YACER101 software package

is now available on the AMSAT-NA web site. (It was previously only available via email forwarding) The current version is YACER101.zip".

Thank you Gunther, the package mentioned above is available from <http://www.amsat.org/amsat/ftp/software/win32/analysis/yacer101.zip> or by FTP from <ftp.amsat.org>, working down through the directories, /amsat/software/win32/analysis/yacer101.zip

## Six-monthly Update of Operational Amateur Radio Satellites

### AO-40 AMSAT OSCAR 40

Launched: November 16, 2000 aboard an Ariane 5 launcher from Kourou, French Guiana.

Status: Currently, the U/V/L-1/L-2 to S-2/K passband is active at various times.

Uplink V-band 145.840-145.990 MHz CW/LSB

U-band 435.550-435.800 MHz CW/LSB

L1-band 1269.250-1269.500 MHz CW/LSB

L2-band 1268.325-1268.575 MHz CW/LSB

S1-band 2400.350-2400.600 MHz CW/LSB

Downlink: S2-band 2401.225-2401.475 MHz CW/USB

K-band 24,048.010-24,048.060 MHz CW/USB

Beacon: 2401.323, 24,048.035

The "AO-40 FAQ", compiled by Steve, VK5ASF is now available at:

<http://www.amsat.org>

For the current transponder-operating schedule visit:

<http://www.amsat-dl.org/journal/adlj-p3d.htm>

### ARISS - International Space Station

Worldwide packet uplink: 145.990 MHz FM

Region 1 voice uplink: 145.200 MHz FM

Region 2/3 voice uplink: 144.490 MHz FM

Worldwide downlink: 145.800 MHz FM

TNC callsign: RSOISS-1

The ARISS initial station was launched September 2000 aboard

shuttle Atlantis. ARISS is made up of delegates from several major national Amateur Radio organizations, including AMSAT.

Status: The ARISS station is operational but the packet system is not switched on at the time of writing. To assist in planning ISS contacts, the ISS daily crew schedule can be found at: <http://spaceflight.nasa.gov/station/timelines/> When crew members have free time, they may be available for Amateur Radio operations.

U.S. callsign: NA1SS

Russian callsigns: RSOISS, RZ3DZR

### AO-7 AMSAT OSCAR 7

Uplink: 145.850 to 145.950 MHz CW/USB Mode A

432.125 to 432.175 MHz CW/LSB Mode B

Downlink: 29.400 to 29.500 MHz CW/USB Mode A

145.975 to 145.925 MHz CW/USB Mode B

Beacon: 29.502 MHz, 145.972 MHz, 435.1 MHz, 2304.1 MHz

Launched: November 15, 1974 by a Delta 2310 from Vandenberg Air Force Base, Lompoc, California. Status: Semi-operational in sunlight. After being declared dead 21 years ago in mid 1981 due to battery failure, AO-7 has miraculously sprung back to life and was first detected by Pat Gowen, G3IOR on June 21, 2002 at 1728 UTC. Jan King, W3GEY

reports AO-7 is running off the solar panels only. It will only be on when in sunlight and off in eclipse. Therefore, AO-7 will reset each orbit and may not turn on each time. On July 11, 2002 AO-7 was successfully commanded for the first time since it was declared dead 21 years ago. Commands were sent and accepted to change the CW beacon code speed. Command investigation continues. So far, 11 different commands have been accepted by AO-7.

### AO-10 OSCAR 10

Our oldest operational amateur radio satellite.

Uplink: 435.030 to 435.180 MHz CW/LSB

Downlink: 145.975 to 145.825 MHz CW/USB

Beacon: 145.810 MHz (unmodulated carrier)

Launched: June 16, 1983 by an Ariane launcher from Kourou, French Guiana.

Status: Semi-operational.

AO-10 has been locked into a Mode-B, 70-cm uplink and 2-metre downlink for several years. It continues to give good contacts when the solar angles are favourable.

### AO-14

Uplink: 145.975 MHz FM

Downlink: 435.070 MHz FM

Launched January 22, 1990 by an Ariane launcher from Kourou, French Guiana

Status: Operational, mode J.



## RS-15 Radio Sport RS-15

Uplink: 145 858 to 145 898 MHz CW/USB

Downlink: 29 354 to 29 394 MHz CW/USB

Beacon: 29 352 MHz (intermittent)  
SSB meeting frequency: 29 380 MHz (unofficial)

Launched: December 26, 1994 from the Baikonur Cosmodrome

Status: Semi-operational, mode-A, using a 2-metre uplink and a 10-metre downlink

## FO-20 JAS-1b

Uplink: 145.90 to 146.00 MHz CW/LSB  
Downlink: 435.80 to 435.90 MHz CW/USB

Beacon: 435 795

Launched: February 07, 1990 by an H1 launcher from the Tanegashima Space Center in Japan.

Status: Although listed as operational and in mode JA continuously, FO-20 has recently been reported silent by numerous operators.

## RS-20

Beacon: 145.828, 435.319 MHz

Launched: November 28, 2002 aboard a Kosmos 3-M rocket from Plesetsk.

Status: Telemetry heard on the 70 cm beacon. RS-20 is an experimental payload aboard the Russian satellite known as Mozhayets — a navigational and scientific satellite. RS-20 transmits CW telemetry. Each frame begins and ends with the call sign RS-20.

## FO-29 JAS-2

Launched: August 17, 1996, by an H-2 launcher from the Tanegashima Space Center in Japan.

### Voice/CW Mode JA

Uplink: 145.90 to 146.00 MHz CW/LSB  
Downlink: 435.80 to 435.90 MHz CW/USB

Beacon: 435 795 MHz

### Digital Mode JD

Uplink: 145 850 145 870 145 910 MHz FM

Downlink: 435 910 MHz 1200-baud BPSK or 9600-baud FSK

Call sign: 8J1JCS

Digital talker: 435 910 MHz

Although listed as operational, FO-29 has recently been reported silent by numerous operators.

## SO-41 SAUDISAT-1A

Uplink: 145.850 MHz

Downlink: 436.775 MHz

Broadcast Call sign: SASATI 11

BBS: SASATI 12

Launched: September 26, 2000 aboard a converted Soviet ballistic missile from the Baikonur Cosmodrome.

Status: Operational but intermittent. The spacecraft is operating in Mode-J, currently configured as an analog FM voice repeater, as power and spacecraft experiments permit.

## SO-50 SAUDISAT-1C

Uplink: 145 850 MHz (67.0 Hz PL tone)

Downlink: 436 800 MHz

Launched: December 20, 2002 aboard a converted Soviet ballistic missile from the Baikonur Cosmodrome.

Status: Operational. SO-50 carries several experiments, including a mode J FM amateur repeater experiment operating on 145.850 MHz uplink and 436.800 MHz downlink. The repeater is available to amateurs worldwide as power permits, using a 67.0 hertz tone on the uplink, for on-demand activation.

## UO-11 OSCAR-11

Downlink: 145.826 MHz FM (1200-baud AFSK)

Mode-S Beacon: 2401.500 MHz

Launched: March 1, 1984 by a Delta-Thor rocket from Vandenberg Air Force Base in California.

Status: Semi-operational. OSCAR-11 has continued to operate in a default mode, controlled by the watch dog timer. The satellite transmits continuous ASCII telemetry for about seven days on 145.826 MHz, followed by about 14 days of silence. These times appear to be somewhat variable, and on the last occasion the sequence was ten days off and nine days ON. The mode-S beacon on 2401.5 MHz transmits continuously. At the present time, ground control are unable to command the satellite, due to low temperatures affecting the command decoder. They will

attempt to command the satellite when the command decoder temperature has risen to 15C. A Windows program for displaying and capturing OSCAR-11 data is now available. This is MIXW2, a general purpose Amateur Radio data communication program written by Nick Fedoseev UT2UZ. You can download the program from [www.mixw.net](http://www.mixw.net). You need the latest version 2.07.

## AO-16 PACSAT

Uplink: 145.90 145.92 145.94 145.96 MHz FM

(using 1200-baud Manchester FSK)

Downlink: 437.026 MHz SSB (1200-baud PSK)

Mode-S Beacon: 2401.1428 MHz

Broadcast Call sign: PACSAT-11

BBS: PACSAT-12

Launched: January 22, 1990 by an Ariane launcher from Kourou, French Guiana. Status: Semi-operational, the digipeater command is on.

## UO-22 UOSAT

Uplink: 145.900 FM 9600-baud FSK

Downlink: 435.120 MHz FM

Broadcast Call sign: UOSAT5-11

BBS: UOSAT5-12

Launched: July 17, 1991 by an Ariane launcher from Kourou, French Guiana.

Status: Operational but UO-22 has been reported as silent. On April 26, 2003 Chris Jackson, G7UPN reported: We're still assessing the situation, but as I posted late last year, when UO-22 entered eclipses again (last week) it was unlikely that the battery would supply sufficient power to operate the spacecraft. This is indeed the case, and the spacecraft is therefore now unusable at this time and on May 10, 2003 Chris reports: Possibly it is permanent. It is currently experiencing eclipses and can not support operations. I haven't run the analyses yet to see when this season ends, and for how long it will be in permanent sunlight again next time around, but it may be possible to revive it for a while at least. At the time of writing UO-22

*Continued on page 55*

**Adelaide-Ottawa**

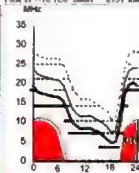
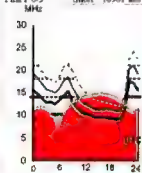
58

**Brisbane-Honolulu**

21

First F 0-5 MHz Short 16901 km

First F 7-10 MHz Short 2131 km



July 2003

Index: 59

**Legend**

UD

E-MUF

C-MUF

F-MUF

AUF

&gt;10%

&gt;50%

&gt;90%

Time scale

**HF Predictions**

by Evan Jarman VK3ANI

34 Alandale Court Blackburn Vic 3130

These graphs show the predicted diurnal variation of key frequencies for the nom-nated circuits

These frequencies as identified in the legend are:-

- Upper Decile (F-layer)
- F-layer Maximum Usable Frequency
- E-layer Maximum Usable Frequency
- Optimum Working Frequency (F-layer)
- Absorption Limiting Frequency (D region)

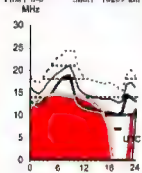
Shown hourly are the highest frequency amateur bands in ranges between these key frequencies when usable.

The path, propagation mode and Australian terminal bearing are also given for each circuit

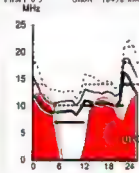
These predictions were made with the Ionospheric Prediction Service program ASAPS Version 4

**Adelaide-London**

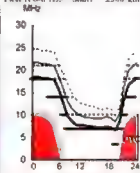
First F 0-5 MHz Short 16269 km

**Brisbane-Montevideo**

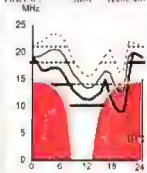
First F 0-5 MHz Short 12472 km

**Canberra-Auckland**

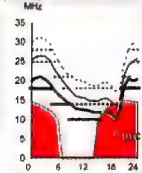
First F 6-8 MHz Short 2300 km

**Darwin-Seattle**

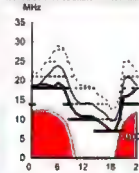
First F 0-5 MHz Short 12262 km

**Adelaide-Los Angeles**

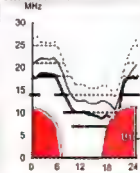
First F 0-5 MHz Short 13159 km

**Brisbane-Tokyo**

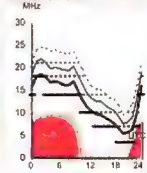
Second F 6-11 MHz Short 7159 km

**Canberra-Honolulu**

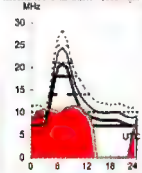
Second F 6-11 MHz Short 3407 km

**Darwin-Singapore**

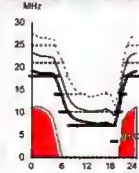
Second F 12-19 MHz Short 1551 km

**Adelaide-Pretoria**

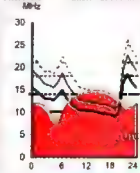
Second F 6-11 MHz Short 10064 km

**Brisbane-Wellington**

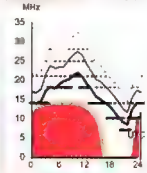
First F 6-11 MHz Short 2508 km

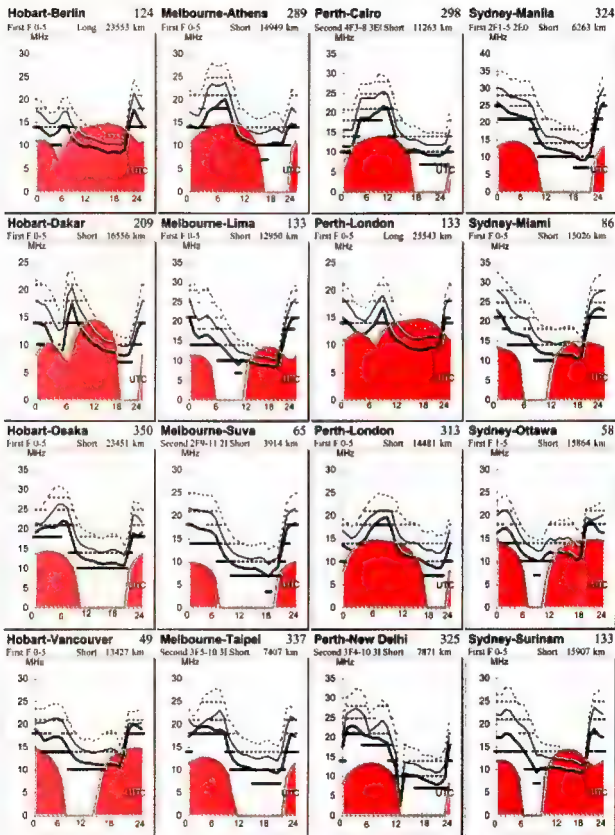
**Canberra-Paris**

First F 0-5 MHz Short 23100 km

**Darwin-Tel Aviv**

Second F 6-11 MHz Short 11302 km





## Product Review

# ICOM IC-910H VHF/UHF Multimode Transceiver

by Doug McArthur VK3UM

**I have been asked by many Amateurs during on and off air discussions, of my impressions and findings of this multimode VHF/UHF dedicated transceiver. As a result I have put together this, my warts and all, appraisal of the radio.**

I have had mine for almost 12 months and in that time I have been able to assess the unit's performance and facilities without being constrained by a time scale. The radio, during this time, has not suffered a single failure.

My unit has been optioned for 23cms (UX-910) and the high stability crystal unit (CR-293) as well as the Digital Signal Processing (DSP) UT-106. These options were especially relevant to my particular fields of interest.

Icom has produced many dedicated VHF and UHF radios (many of which I have either owned or "played with") and this latest model provides top of the line performance commensurate with a multi functional radio. I would not go as far as to say the unit provides the best single band performance of all the previous radios, for it certainly does not, but as a compromise its performance and facilities are, in my view, unrivalled.

After unpacking the unit and hooking it up on the test bench (it requires an external 13.8v 25A supply) my first aim was to check the receiver sensitivity and power out put on all bands and modes. I need not have bothered as all exceeded the specifications listed in the handbook, however it does give you a "feel" for the radio's performance and confirms the manufacturer's quality control. Incidentally, the carrier suppression was found to be far in excess of that specified.

The tests took a lot longer than I care to admit. I had seemingly lost my ability to guess the latest "Icom way of multi functional button usage". All clearly explained in the manual mind you, but to front the box and drive it straight off left me struggling a tad.



My immediate reaction to all the facilities, functions, and variables was to question why would you need all these (to me) sophisticated inclusions.

The facilities are just amazing. Probably 60% you will never use, but given everybody's differing interests it will not be the same 60%. Whatever your interest or specific requirement you may have in VHF/UHF, you would be hard pressed not to find just what you require in this radio. I also could not help thinking of the problems a non-technical licensee would face understanding the terms, as well as the implications they would face setting up a modern day radio!

Fundamentally the selectable modes available are SSB (USB/LSB), CW (2.3 kHz), CW-N (500Hz), FM and in VK covers 144-148, 430-450, and 1240-1300 MHz (additional optional).

The IC-910H has two VFOs for each of the standard 2 metre and 70cm bands and each recalls the mode of operation. All provide selectable quick tuning in 1kHz or 1MHz steps. Also you may select the tuning steps from 1Hz (SSB/CW) to 100kHz (FM). Frequency entry can also be made from the front panel keypad.

Receiver functions provide a multitude of options. Most are multifunctional and can be set independently for each band or memory function. This is where I found the instruction manual essential as many functions, not initially apparent, were

revealed! Here are some of the facilities available. Dual frequency watch, all mode squelch, receive incremental tuning (RIT), Intermediate Frequency (IF) Shift, Automatic Gain Control (AGC) time constant selection, Automatic Frequency Control (AFC for FM only), FM centre indicator, rudimentary (but very useful) band scope with adjustable sweep time interval, selectable attenuator, noise blanker (quite effective on rain static and pulse ignition noise), tone squelch frequency selection, Automatic Notch filter (ANF), Noise Reduction (NR) from the optional DSP unit, auto and manual setting of repeater operations, including tone gated squelch, full all facilities programmable scan function, including a most useful Tone scan facility. Another major feature is the Satellite Operation modes. That in itself could would require many paragraphs to explain. Additionally there are 212 memory channels available (99 regular, 6 scan edges, plus 10 satellite memories).

Importantly, data communication is well catered for by the provision of rear panel data and accessory sockets. The IC 910H does not provide a Frequency Shift Keying (FSK) option but relies on using Audio Frequency Shift Keying (AFSK). It is stated it is capable of speeds up to 9600 bps.

Transmit wise the power output is a genuine 100 watts on 144, 75 watt on 70cms and 10 watts on 23cms on all modes. The level is infinitely variable

as mentioned above too. The 'on temperature demand' fan is fairly quiet and does not run all the time on receive as some other radios do. Note 23 cm is not standard but is added as an option. (UX 910)

This radio adjusts power output on CW (or any other mode for that matter) without the spiked wave front many similar transceivers exhibit (Yes this box has had 90% of its hundreds of contacts on CW!) It also has an in built keyer (no character store facility) semi break-in, with adjustable weighting, delay pitch, and side tone level. In SSB and FM fully adjustable Voice operated Transmission (VOX) is included. Speech compression is also provided and from off air reports provides an advantage without noticeable distortion. Like most rigs, careful operator adjustment is essential to produce a clean on air signal.

But that's not all !...

The IC-910H can also be remotely controlled from a back panel socket via an RS-232C port. (It will require an optional CT-17 level converter). All the required commands are documented with in the instruction manual for those with a programming flare and nothing much to do on a cold winter's evening.

For the serious-minded, the radio provides, via the accessory output connector, internally programmable switching facilities for both remote transmit amplifiers and receive pre-amplifiers on all 3 bands. (Where fitted). This is a unique advantage for the multiband multi amplifier operator who wishes such switching. Unfortunately, for the "specialist user" who would like separate (rear panel) accessibly receiver inputs, this transceiver does not go quite that far! Hopefully Icom may address this in the future.

Here are some of my specific findings that may interest you gained from operating this radio over the past 12 months

**Receiver noise figure.** I have measured all bands by Y factor substitution (corrected Sun Noise) and they equate to: 144MHz < 1.3 dB 432MHz < 1.6 and 1296MHz < 1.8. Not outstanding but well inside what could be expected for modern multiband transceivers. For really serious weak signal work Low Noise Preamplifiers are always must. Receiver sensitivity was measured and was found to be better than stated in the specifications

The ability to monitor simultaneously two bands at the same time is a very useful and practical feature. A big tick!

The overall end to end gain and frequency stability is excellent. This may not appear important, but for me this characteristic is essential when measuring astronomical noise sources and delving for extremely low level Doppler offset signals. Although not a precision measuring instrument by a long chalk, it does however provide a most ample crosscheck for my purposes. Frequency resolution at  $\pm 0.5$  ppm is quite adequate even at 23cms. Note this is an additional option. (CR-293). These properties will be of considerable benefit for those venturing in the new digital modes. (Eg JT44 and FSK441).

Large signal handling is better than most radios in its class. Similarly I also found the transmitted spectral quality adequate. Subjectively speaking, with our comparative low activity on the bands, you will not cause any excessive problems to your locals nor will they trouble you. If you happen to live close to a VHF pager transmitter you are unlikely to suffer the cross mode and overload problems many of today's rigs exhibit. If operating in a multi transmitter field day situation then the side band noise could require greater physical (space and/or frequency) separation. The bottom line is that the IC-910H performs very well indeed compared with many other similar radios on the market and considerably better than the multi mode multi "all" band transceivers.

**RIT.** For EME (and some Satellite applications) operators the range is not adequate.  $\pm 1$  kHz on 144 and 432 MHz (SSB/CW) or  $\pm 2.0$  kHz for 1296 MHz will not provide for the Doppler Shift found under certain circumstances. This is only a minor inconvenience as you can always use the dual VFOs.

Another minor facility lacking (that would be nice) is that it cannot select an alternate frequency display to show the actual and not the intermediate frequency. This would be useful for those that use this rig as an IF for transverters.

**Noise blanker.** Quite adequate but not

fantastic. It handles most impulse noise and to some extent rain static. I am "picky" when it comes to noise blankers and this one, on my scale, rates 5 out of 10. It would also be nice to turn off the AGC

**The Auto Notch filter** Every rig should have one! Works a treat. I would wager most on VHF/UHF don't have CW QRM nor require its use but it's there for your birdies and it is very effective. The IF Shift is also most useful and very effective

I have left the DSP option and its effectiveness to last. From the onset I should declare that my XYL claims I have always had selective hearing and only the sound of food gets through the built in filter. Seriously though, my ability to copy CW off the Moon in the noise (and even slightly below) has well "developed" over many years of practice. Along with this, my upper frequency response has fallen dramatically with time. My HI FI is anything flat to 1kHz!! (Sounds familiar?) Anyway this is what I have found when using the DSP FFT filters. Others may find totally differing results. I believe a lot of the final effectiveness "can you read a signal better with DSP?" Can

depend upon your own situation? Don't get me wrong, I too can mathematically prove to you that an improvement of x dB will be achieved with

a FFT of x! The bottom line to all this with the DSP in the IC-910 (and a IC-756 for that matter) was a significant improved readability in cases of very marginal SSB signals where without DSP I could not copy the SSB signal but with it I was able (i.e a Q1 was improved to a readability Q3/4). However on CW my old ears seemed its equivalent!?? Without doubt it is a most worthwhile feature and under weak signal SSB situations in particular the gain in readability can be dramatic. I have played with it considerably listening to my SSB signals off the Moon listening to the fascinating effects of libration fading taking place in such narrow bandwidths but that's another story!

The bottom-line. A brilliantly performed Radio with most of the features you could ever desire!

# VHF/UHF - An Expanding World

David Smith VK3HZ, vk3hz@wia.org.au  
Leigh Rainbird VK2KRR, vk2krr@telstra.com

## Dealing with a weak signal

Claims about the demise of weak-signal activities from the southwest are grossly exaggerated. Following last month's statement that Wally VK6WG seemed to be the sole remaining serious weak-signal station in southern WA, I received emails from two people - both national distance record holders, no less - begging to differ.

Bob VK6BE in Albany says that he is still very much active, and serious, on 6 m, 2 m and 70 cm. While down the hill from Wally, Bob has worked many VK5 and VK3 stations, although this year working only into VK5 on 2 m. Bob holds the national distance record for a 70 cm contact to a mobile station (VK3KAJ/M3 - 2224.5 km). He complains that he often hears the beacons but there never seems to be anyone at the other end. I've heard that before!

Darrell VK6KDC in Manjimup is also an active station in the southwest. He currently holds the VK6 record on 2 m and the national record for 70cm, both to VK3DEM (now VK3EK) - 2862.2 km. He also complains that he hears beacons but there is no one at the other end.

My apologies to both of you, and to any other active stations in that area. We look forward to hearing more from you.

Regarding difficulties in raising stations at the other end when the band is open, it's probably time to mention a few Internet resources that may help for weak signal work. Many shacks now have a permanent PC with an Internet connection and so the following may be useful:

- The VK VHF email reflector is a hub for discussion of all aspects of VHF/UHF weak signal work. Band openings and the like are often notified through this reflector. Currently, 265 people are registered on the site. Refer to the NSW VHF DX web site (see below) for details on how to register
- The NSW VHF DX web site - <http://www.vhfdx.oz-hams.org/> - contains a wealth of VHF/UHF information. The site is a "work in progress" so check back regularly.

- The VK/ZL VHF-UHF Propagation Logger website - <http://www.vk4cp.com/vklogger.php> - is a relatively new site with a chat-style interface. Notification of band openings, arranging QSOs and general VHF/UHF chat is encouraged here.
- Hepburn's VHF/UHF Tropospheric Ducting Forecast - [http://www.iprimus.ca/~hepburnw/tropo\\_austr.html](http://www.iprimus.ca/~hepburnw/tropo_austr.html) - this site takes the skill out of tropo work. It uses weather forecasts to predict tropo conditions and can be uncannily accurate.
- DX Summit - <http://oh2aq.kolumbus.com/dxs/> - this site lists reports of openings and DX contacts on all bands. It's probably of most interest to 6 m operators.
- Microwave mail list - <http://mbs.valinet.com/mailman/listinfo/microwave> - for those interested in the microwave region, this US-based mail list has lots to offer.

## EME

Guy Fletcher - VK2KU

The 2-metre EME scene in VK is slowly growing again with active stations at present in VK2, VK3, and VK7; doubtless others too! VK9LS was also recently activated on Lord Howe Island for 2 m EME by Rex VK7MO, who was able to work several of the big guns in America and Europe.

Until recently the continuous spread in capability of 2 m EME stations could be roughly divided into 3 levels - the really big stations like W5UN and a handful of others who could hope to work small stations running limited power at home and on expeditions; the medium stations running 6 to 8 yags (or 4 very long ones) and at least 1000 W; and the small stations like me who could only really work medium and large stations. Then along came Joe Taylor's WSJT program and the JT44 digital mode. A 4th level of small station has emerged with 1 or 2 yags (often without elevation) and relatively low power, and which can work level-2 stations (and level-3 sometimes) on JT44. And suddenly level-3 stations can work each

other with JT44 relatively easily. I'm having a ball, and so are the others!

I still enjoy CW contacts, and happily accept CW scheds. Many stations in fact refuse to work JT44, either from personal choice or because they see it as somehow an inferior mode! If you want to work them, then it has to be on CW.

In the last month or so (mid April to the end of May) I have made 5 EME contacts on CW and 17 with JT44. Countries include OK, I, ZS, PA, DL, GW, CT, K/W, GI, and UA9. Most of these are new "Initial" contacts with only a few repeats, increasing my initials to 74 and my countries to 29.

## 13 cm Band Interference

VK6 reports interference being suffered by AO40 users in the 2.4 GHz band. It turns out that the QRN corresponds with the commencement of trials of the new 3G mobile phone services in Perth. There are a handful of such test sites spread over the metropolitan area. The 3G services operate in the range 2 - 2.2 GHz which falls into the image response of the S-Band down converters when using a 2 m I.F. Possible solutions include the use of better filtering in the front end of the converter, or changing to high-side local oscillator injection.

With the projected future explosion in the use of 3G mobile phones, this could be a problem that many users of the 13 cm band may encounter.

## Digital Modes

Rex Moncur - VK7MO

Welcome to Bill VK5ACY at Kangaroo Island on 2 m FSK441 who will be looking for skeds. Also Jim VK3ZYC who was copied at Lord Howe Island on 2 m FSK441 operating JT44 on 23 cm.

A number of stations have been exploring the use of JT44 on 23 cm for DX on tropo and via Aircraft Enhancement. Contacts of around 500 km plus have been made by VK2KU, VK3FMD, VK3XLD (his first JT44 contact), VK3ZYC, VK3KAI and VK7MO. Guy VK2KU and Peter VK3KAI created a new digital record on 23 cm of 625 km. These contacts require a lot of

skill, as you are dealing with many variables due to the short durations of enhancement, problems of frequency stability at both ends, the need to beam accurately and the fact that you cannot hear the signal most of the time. Because of the short duration of enhanced signals Guy VK2KU has been looking at an improved format for terrestrial QSOs and even looking into the mysteries of K1JT's source code

Last month Leigh, VK2KRR, reported on the initial Lord Howe Island VK9 2 m contacts VK9LS (with VK7MO as the operator) changed location on 10 May to get a better take-off to Eastern Australia. Unfortunately, Brisbane was still obstructed by hills and, despite extensive testing, only a weak tropo signal of around 3 dB in 0.3 Hz bandwidth could be detected from VK4AFL on 70 cm. In addition to last month's report the following contacts were made - JT44 2 m (VK2KU, VK2JJK) JT44 2 m EME (SM7BAE), JT44 70 cm (VK2KU), FSK441 2 m (VK3AFW, VK3CY, VK7DM, VK3UM, VK7JG, VK3HZ, VK3AXH, VK3HY, VK3AEF VK3BWT, VK3AUU & VK2ED). There was even some SSB with VK2ZAB on 2 m and 70 cm and VK2KU on 2 m.

## 2 m & 70 cm FM DX

Here, at The Rock, NSW, over the month of May, there were 26 days of dead band, or very poor conditions on 2 and 70 FM. The colder weather is certainly hampering chances of extended distance Tropospheric radio contacts. The other 5 days of May provided some excitement with some particularly good conditions.

Significant Ducting conditions occurred on only two occasions during May in the south. The month got off to an excellent start, when at approximately 6.40 pm EST on 1<sup>st</sup> May, a Duct became workable. The workable paths varied over time, but took in Southern and Western VK2, most of VK3 and VK5. Significant simplex contacts occurred between myself and with VK5AJW, Jim, in Cowell, with a 5/3 signal at 947 km. Also with Brian VK5ZMB in Gawler, with a weak 4/1 signal at 735 km. These stations were operating only very basic systems; I think Brian may have even only been on a hand held. Some of the more distant repeaters noted pushing their signals across to the east on this night were 146 750, 5RAC from Pillaworta Hill at

1019 km, 146.800, 5REP from Coolanle at 961 km; 146.975, 5RAE from near Port Augusta at 910 km. An interesting one in from up in the northwest was 147 000, 2RBH from Broken Hill at 638 km. Of the bigger signals from the repeaters, Port Augusta appeared to peak at S9 +40 dB, with Port Pirie, Mt Kitchener and Murray Bridge S9 +20 dB. The majority of the repeaters had all but faded out by 2 am, that is all except for Port Augusta and Port Pirie, which were accessible still at 7 am the following morning, with Port Augusta still at S9 +40 dB. They rapidly dropped out by 7.30 am. Noted also during the morning of the 2<sup>nd</sup> of May was VK2ALN in Canowindra accessing the little, if ever used, 146.850 repeater in Griffith central VK2. VK3ANW at Kyabram and VK3JGL at Bendigo making the grade into 146.950 VK1RGI, a good distance at 400 + km. On 70 cm VK3DCZ reported hearing the Wagga repeater on 438.025 in Yarrawonga. It would appear that the 70 cm long distance repeater contacts are proving quite a challenge at this stage.

After the month's big opening, the band was quite dead until the evening on Saturday 3<sup>rd</sup>. A Duct became usable which appeared to cover mostly the western side of VK3 and southeastern VK5. This started around 9 pm and went to 10.30 pm. Extending as far as Mt Gambier at 630 km, and Naracoorte on 2 m, also taking in Mt. William in the Grampians, which is not often heard these days. VK3ANW and VK3XDP were copied simplex but had bad QSB.

Then on 4<sup>th</sup> May, a really interesting and unusual Duct opened into Adelaide. Unusual because it began here at lunchtime, around 12.20 pm. A number of stations from in the east were having a great time taking part in a multi operator, multi location QSO via the Murray Bridge repeater (great voice idents on this repeater), which took in stations from 3 different states. Those involved were VK5NNRV, VK5ZMB, VK5PDL, VK3JGL at Bendigo, VK5ZLT at Naracoorte, VK5MM, VK2LRR at The Rock at 733 km, and VK3MTV in Mildura. VK5 noted a number of other repeaters but not to the extent of the opening on the 1<sup>st</sup>. It ended at 4 pm.

Later that evening the Duct area shifted and contacts were being made into VK7 by some stations as far north as the NSW border. I realised this when, around 8.30 pm, I came across VK3ANW

in Kyabram, northern VK3, making a simplex contact 540 km away with VK7LCW in Penguin on 146 500. I believe VK3JOO made a similar contact from Bendigo. Other simplex of note was between VK3YD in Monbulk and VK2LRR, 5/7 signal here at The Rock.

A bit of rare 70 cm activity: late at night on 10<sup>th</sup> May, a simplex contact was completed between me, VK2LRR, and Peter VK3XDP in Eppalock. Signal from Peter was 5/5 and the distance was 298 km, second furthest on 70 for me. It could have been an aircraft scatter contact as it lasted only a few others.

In the evening of Friday 30<sup>th</sup> and morning of 31<sup>st</sup> I have had reports of a Duct workable from central VK3 up to Central VK2. Being unable to work FM in the latter part of the month I missed this one, but did hear of Bendigo stations in VK3 working into VK1RGI on 2m and a station in Bathurst doing the same.

## Meteor Scatter for Winter

DX contacts are still possible because FSK441 is used by copying short bursts or 'Pings' of signals, which have been reflected or 'Scattered' from incoming meteors. The 'Pings' carrying the stations' signal are only received at the far end from as little as 20 milliseconds to over 1 second, but this is enough time to enable the receiving station to get at least some of the information.

Recently a successful experiment was carried out on FM, using the weak signal meteor scatter mode FSK441, between VK7MO, Rex in Hobart and VK2KRR Leigh 847 km away at The Rock. Amazing. If you would like to download the program WSJT, visit Joe Taylor's website at <http://pulsar.princeton.edu/~joe/K1JT>

FSK441 is not designed with FM as a mode of operation, but, with patience, it still seems to work. For better results, a Yagi and pre amplifier are desirable. Some further experiments need to be carried out using JT6M which, my initial testing shows, may be better yet.

A new group email reflector has been activated, called the VK VHF FM DX Group. This is really handy for exchanging information on the subject and organising contacts. Yahoo site address is at: [http://au.groups.yahoo.com/group/VKVHFFMDX\\_Group/](http://au.groups.yahoo.com/group/VKVHFFMDX_Group/)

## FOR SALE NSW

- **Valve:** 6216, \$5; CV354, \$5, Transformer PR 240, sec 230 V, 0.12 A and 6.3 V, 0.6 A \$15 P.P. Diater VK2EDD. QTHR. Phone 02 4982 9847.
- **Power supply 10-16 V, 43 A** no interference, current limit, over-voltage protection. Instructions, circuit available. Post anywhere in Oz (5kg). \$75. Bob VK2CAN Phone 02 9416 3727.

## WANTED NSW

- **Instruction manual for Marconi signal generator CTH52A** or photocopy. All costs reimbursed. VK2CSS, Phone 02 4821 0756.
- **PMG or any bug key.** Contact Herman Willemsen, email hermanw@smatchat.net.au

## FOR SALE VIC

- **Spider quad hubs,** two halves \$200. Solid fiberglass spreaders to suit same, eight at \$20 each. ONO. VK3YJ QTHR. Phone 03 9315 9387, email xdrover@bigpond.com.au
- **SME pickup arm model 3009,** series II, Shure cartridge original packing, manual, tools mounting template for the connoisseur \$70. Phone 03 9592 9957, kee@ozemail.com.au.
- **Service manual Kenwood TS-120V.** VK3ECT, Phone 03 5156 7789.
- **Standard C-430 70 cm 10 watt transmitter,** surplus to needs, give away cost of freight/postage, with handbook. **AWA Forephone FPI** transmitter, no top cover or plastic case cover, otherwise good condition

with photocopied manual \$90. Rodney Champness VK3UG QTHR Phone 03 5825 1354

- **Deceased estate: Kenwood comm's receiver R-5000** and manual s/n 80500034, mint cond, \$500 ono. Ted VK3ALT QTHR, Pakenham, Phone 03 5941 1248.
- **30 m survival base tower with mast** 3 m triangle base, gal angle. Dismantled in 3 m sections, ready for transport or can deliver in Victoria \$1000 ono. M Trickey Phone 0419 037 077

## WANTED VIC

- **Johnson Viking 500 transmitter** circa 1957. JR Radio Service handbook VR series 1964 No 128 HF transceiver. Rodney Champness VK3UG QTHR. Phone 03 5825 1354.
- **HF beam 10/16/20 m,** Moseley, Hy-gain, Cushcraft, anything considered **Heavy duty rotorator.** Complete unit would be great VK3PT, Bendigo. Phone 03 5439 6321, email wjcrmk@netcon.net.au
- **Manual for Daiwa RF-660** speech processor, VK3GMM. Phone/fax 03 5985 2671

## FOR SALE QLD

- **Unmarked Yaesu FTDX-401** with spare O/P tubes \$150. **Ten-Tec Delta 880** 10-160 m \$150. Both have mike and handbook. Paul VK4DJ Phone 07 4775 7998
- **Kenwood TS-50 HF transceiver.** Serial 10200172. \$950. **Yaesu tuner FC-700** \$150. **Power supply, Electrophone.** 35 amp, 25 amp cont. \$95. All in perfect condition. John Gilard VK4AJG, 375 Queen St, Cleveland Qld 4163. Email ruth.john@bigpond.com.

## WANTED SA

- **Micro switches:** Burgess or similar. Prefer spring lever action. Bruce VK5ZJE. Phone 08 8382 1563
- **Icom IC-480A** all mode 70 cm transceiver, working or not. Mervyn VK5MX, QTHR. Phone 08 8346 7042
- **Photocopies Kenwood AT-250 auto. ant. tuner manual,** English version. Will pay costs. Post reply. Bob VK5KWR QTHR.
- **To assist with restoration, details on CODAN C-2000C receiver board circuit/details Granger transceiver type 174** Also require **plug in modules** for Granger receivers/transceivers and an **AWA Army type A510 transmitter/receiver whip aerial** (Used on ELCO type 6332 transceivers). Malcolm Haskard VK5BA, QTHR. Phone/fax 08 8280 7192, email mhaskard@chariot.net.au

## WANTED WA

- **40 pin double-sided extension board** for Yaesu FT-107 QTHR VK6FD

## FOR SALE TAS

- **1 x 70 cm Skeleton slot \$70** 2 x Philips 900 remote head 2 metre transceivers with cables and mics, \$125 each. **TASS-BELL D904** transformer brand new \$100. 3 x patch boxes \$15 each. VK7KCC on Phone 03 6429 3294 email klopj@dodo.com.au

## TRADE ADS

**PSK-31, SSTV, RTTY SOUND BOARD**  
Interfaces Fully isolated, ready to plug in  
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johnny@melvin.com, G3LIV QTHR

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available for \$5.00 incl. post.

### Agencies

Active Electronics, Tas  
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Tower Communications, Perth  
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<http://www.hamsearch.com>

a not-for-profit site that is a search engine  
for hams

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- Hamads may be submitted by email or on the form on the reverse of your current **Amateur Radio address flysheet.** Please print carefully and clearly, use upper AND lower case.
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## Reviews of equipment?

Over the years I have been a member of the W.I.A. I have been receiving A.R. magazine. First place I tend to look at is the Hamads, second place is the VK3 notes, then I tend to read the review section of equipment (transceivers etc).

But over the past months and years, there have been no reviews of any new or old equipment. If I wish to read reviews of equipment I have had to buy that other magazine when it's on the newsagents' stands. For a magazine that is for amateur radio could you look at putting more reviews of equipment in it, as its very lacking in this area at present.

Regards

Alan VK3VD

tfoistne@melbpc.org.au

**Opinions expressed in the Over To You columns do not necessarily reflect official policy of the Wireless Institute of Australia.**

## WIA - advocate for amateurs

I find it ironic in the extreme that Peter VK5ZPG is whinging about how little the WIA is doing for him!

A minor excursion into AR history would have informed Peter that the Z-call privilege he enjoys was only made possible by the actions of the WIA. The ACA does not negotiate with individuals.

Peter waxes about the Foundation Licence being some plot hatched by nameless individuals with "personal agendas at play".

Peter, I only read AR too, but I am well informed on the subject. Thanks to AR, I know my Federal Councillor's name and number, and I know the contact details of any number of dedicated WIA members who would be very happy to hear some constructive comments or criticisms from you.

Peter seems surprised and more than a little indignant that the WIA might make a decision on his behalf. Well !! Welcome to the real world ! If you can't

be bothered participating in the management and political aspects of your beloved hobby, then you have absolutely no right to complain that the WIA only represents 25% of amateurs in this country. Look at it from the other side - 25% of us are paying for the privileges the other 75% enjoy for free! As our numbers dwindle so will our list of frequencies.

Finally, Peter's last statement says it all. "... let's do something about that....." Peter, to effect change, you must actually DO something - not just grizzle to the AR editor. There are many of us in the proud 25% who would love to see you actively participating in the change and recruitment processes. Let's all hope your letter-writing energies can be channelled into action !

John Sparkes VK6JX

Ex-WIA VK6 Division Councillor, NCRG member (hon), DX Chasers Club member - participant in Thevenard Island IOTA DXpedition, June 13-23 2003, Participant in Woody Island and Direction Island IOTA DXpeditions and many JMFDS. Full call since 1975 - 275 countries worked

## AMSAT

*Continued from page 47*

is still silent. Being the last of the "big-three" KO-23 - KO-25 - UO-22, it will be sadly missed by the 9600 baud digital gang. Should it not come back on it will spell the end of an exciting era in amateur radio satellite digital comms that spawned WISP and a host of goodies that rivalled the early days of the Internet.

## IO-26 ITAMSAT

Uplink: 145.875 145.900 145.925 145.950 MHz FM (1200-baud)  
Downlink: 435.812 MHz SSB  
Broadcast Callsign: ITMSAT-11  
BBS: ITMSAT-12

Launched: September 26, 1993 by an Ariane launcher from Kourou, French Guiana. Status: Semi-operational, the digipeater function is on and open for APRS users.

## NO-44 PCSAT

Uplink/downlink: 145.827 MHz 1200 baud AX.25 AFSK via W3ADO-1  
Aux/Uplink: 435.250 MHz 9600 baud via PCSAT-2 (off)  
APRS Downlink: 144.390 MHz (Region 2)

Launched: September 30, 2001 aboard an Athena-I rocket from the Kodiak, Alaska launch complex.  
Status: Operational.

PCsat is back to eclipses and may not respond.

## MO-46 TIUNGSAT-1

Uplink: 145.850 or 145.925 MHz 9600-baud FSK  
Downlink: 437.325 MHz  
Broadcast callsign: MYSAT3-11  
BBS: MYSAT3-12

Launched: September 26, 2000 aboard a converted Soviet ballistic missile from the Baikonur Cosmodrome.

Status: Operational at 38k4-baud FSK. MO-46 is the last of the high speed digital birds still operational. When I last looked there were not many image files available for download.

## AO-49 AATIS OSCAR-49 (SAFIR-M)

Uplink 435.275 1200-baud AFSK  
Downlink 145.825 9600-baud FSK (optional voice message)  
Broadcast callsign: DP0AIS

Launched: December 20, 2002 aboard a converted Soviet ballistic missile from the Baikonur Cosmodrome.

Status: Operational.

AO-49 (SAFIR-M) is a German amateur radio payload onboard the small German scientific satellite "RUBIN-2". AO-49 was built by the German amateur radio association. AO-49 is designed as a "store and broadcast" system for APRS based messages, dedicated for the use of schools in combination with the existing WX-Net and planned buoy experiments in Germany. No transmissions detected since the 1st of February 2003! It appears AO-49 is not properly aligned to illuminate the solar panels. This should end soon. Due to its orbit, AO-49 was in a phase without eclipses until 13 Feb 03.

ar



# Division Directory

*The Amateur Radio Service exists for the purpose of self training, intercommunication and technical investigation. It is carried out by amateurs who are duly authorised people interested in radio technique solely with a personal aim and without pecuniary interest.*

The Wireless Institute of Australia represents the interests of all radio amateurs throughout Australia. National representation is handled by the executive office under council direction. There is one councillor for each of the seven Divisions. This directory lists all the Divisional offices, broadcast schedules and subscription rates. All enquiries should be directed to your local Division.

## VK1 Division Australian Capital Territory

GPO Box 600, Canberra ACT 2601

President	Alan Hewes	VK1WX
Secretary	Deane Wallington	VK1DW
Treasurer	Linden Orr	VK1LSO

## VK2 Division New South Wales

109 Wigram St, Parramatta NSW

(PO Box 432, Harris Park, 2150)

(Office hours Tue, Thu, Fri, 1100 to 1400 hrs.)

Phone 02 9669 2417

Web: <http://www.wi2nsw.org.au>

Freecall 1800 817 644

e-mail: [vk2wi@ozemail.com.au](mailto:vk2wi@ozemail.com.au)

Fax 02 9633 1525

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## VK3 Division Victoria

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(Office hours Tue 10.00 - 2.30)

Phone 03 9865 9261

Web: <http://www.wi3vic.org.au>

Fax 03 9865 9298

e-mail: [wi3vic@iwi3vic.org.au](mailto:wi3vic@iwi3vic.org.au)

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Web: <http://www.wi4q.org.au/vk4>

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## VK5 Division South Australia and Northern Territory

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Phone 08 6294 2992

Web: <http://www.sant.wia.org.au>

e-mail: [peterc.reichelt@bigpond.com](mailto:peterc.reichelt@bigpond.com)

President	Trevor Quick	VK5ATQ
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PO Box 10 West Perth WA 6872

Phone 08 9351 9873

Web: <http://www.wia.org.au/vk6>

e-mail: [vk6@wia.org.au](mailto:vk6@wia.org.au)

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## VK7 Division Tasmania

PO Box 371 Hobart TAS 7001

Phone 03 6234 3553 (BH)

Web: <http://www.wia.org.au/vk7>

e-mail: [vk7@useccz.com](mailto:vk7@useccz.com)

President	Phil Corby	VK7AX
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## Broadcast schedules All frequencies MHz. All times are local.

VK1WI transmits each Thursday evening at 2000 hrs local time on VK1RGI

146.950 MHz and 438.375 MHz including the linked repeater system on

VK2RGN Goulburn, VK2RHR High Range, VK2RMP Madden Plains and

VK2RTW Wagga Wagga. VK1 Home Page: <http://www.vk1.wia.ampr.org>

**Annual Membership Fees.** Full \$80.00 Pensioner or student \$71.00. Without *Amateur Radio* \$48.00

VK2WI transmits every Sunday at 1000 hrs and 1930 hrs on some or all of the

following frequencies (MHz): 1.845, 3.595, 7.146, 10.125, 14.170, 18.120, 21.170,

24.950, 28.320, 29.170, 52.150, 52.525, 144.150, 147.000, 432.150, 438.525,

1273.500. Plus many country regions on 2m and 70cm repeaters. Highlights are

included in VK2AWX Newcastles news Monday 1930hrs. on 3.593, 10 metres and

packet radio. Continuous slow more transmissions are provided on 3.699 and

146.950. VK2RSY beacons on 10m, 6m, 2m, 70cm and 23cm. Packet on 144.850.

**Annual Membership Fees.** Full \$80.00 Pensioner or student \$63.00. Without *Amateur Radio* \$50.00

VK3EWI broadcasts on the 1st Sunday of the month at 20.00hrs Primary frequencies,

3.615 LSB, 7.085 LSB, and FM(R)ja VK3RML 146.700, VK3RMM 147.250, VK3RWG

147.225, and 70 cm FM(R)ja VK3ROU 438.225, and VK3RMU 438.075. Major news

under call VK3ZWI on Victorian packet BBS and WIA VIC Web Site.

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EVERY SUNDAY, at 9am LOCAL (Sat 2300 UTC). From Far North Queensland On 7.070/2

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147.000, 438.500 MHz. Right throughout VK4 scan 146.8 to 146.8 MHz again at 9am local.

SUNDAY 6:45pm hear LAST week's QNEWS broadcast 3.605 and 147.0 MHz from South

East Queensland. MONDAY 7:00pm hear YESTERDAY's news again on 146.875 MHz

broadcast from Brisbane Bayside repeater, and then 7:30pm on 3.605 and 147.0 MHz from

Stn East Queensland. Text editions on packet internet and personal email, visit

[www.wia.org.au/vk4](http://www.wia.org.au/vk4) News is updated 24/7 in both text and audio on this site. MP3 Audio from

same website by 2300 hours each Saturday. Contact QNEWS, packet sp

QNEWS@VK4WIE.BNE.QLD.AUS.OC email [qnews@wia.org.au](mailto:qnews@wia.org.au)

**Annual Membership Fees.** Full \$95.00 Pensioner or student \$81.00. Without *Amateur Radio* \$59.00

VK5WI: 1843 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100

FM, 147.000 FM Adelaide, 146.800 FM Mildura, 146.900 FM South East, 146.925 FM

Central North, 438.475 FM Adelaide North, ATY Ch 35 579.250 Adelaide. (NT) 3.555

LSB, 7.065 LSB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. The repeat of the broadcast

occurs Monday Nights at 1930hrs on 3585kHz and 146.675 MHz FM. The broadcast is

available in "RealAudio" format from the website at [www.sant.wia.org.au](http://www.sant.wia.org.au) Broadcast Page

area.

**Annual Membership Fees.** Full \$88.00 Pensioner or student \$73.00. Without *Amateur Radio* \$58.00

VK6WIA: 146.700 FM(R) Perth at 0930hrs Sunday relayed on 1.865, 3.564, 7.075, 10.125,

14.115, 14.175, 21.185, 29.120 FM, 50.150 and 438.525 MHz. Country relays 3.582,

147.200 (R) Cataby, 147.350 (R) Bussellton, 146.900 (R) Mt William (Bunbury), 147.000

(R) Katanning and 147.250 (R) Mt Saddleback. Broadcast repeated on 146.700 at 1900

hrs Sunday relayed on 1.865, 3.564 and 438.525 MHz; country relays on

146.900, 147.000, 147.200, 147.250 and 147.350 MHz. Also in "Real Audio" format from

the VK6 WIA website

**Annual Membership Fees.** Full \$71.00 Pensioner or student \$65.00. Without *Amateur Radio* \$39.00

VK7WI: At 0930 hrs every Sunday on 146.700 MHz FM (VK7RHT, Hobart) and relayed

on 147.000 MHz FM (VK7RAA, Launceston), 146.825 MHz FM (VK7RMD, Ulverstone),

146.750 MHz FM (VK7RNV, Ulverstone), 147.075 MHz FM (VK7RWC, Rosedale), 3.57

MHz LSB, 7.090 MHz LSB, 14.130 MHz USB and UHF CB Channel 15 in Hobart area.

**Annual Membership Fees.** Full \$90.00 Pensioner or student \$77.00. Without *Amateur Radio* \$57.00

VK8 Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown, relayed on 14 or 28 MHz. The broadcast is downloaded via the Internet.

# Port Macquarie Field Days

(Queen's Birthday weekend)

The Port Macquarie Field Days were held over the Queen's Birthday weekend, 7th and 8th June at the Sea Scout hall in Port Macquarie. The weather was very kind to us, two beautiful SPRING TYPE DAYS even though it is winter. Attendance was up on last year and a wonderful experience was had by all.



The disposal tables were kept busy as were the WIA NSW DIVISION bookstand & the display of Digital Modes. The display of old meters and the effect of magnetic forces on aluminium drew considerable attention.

The hounds were taxed by our local foxes but enjoyed the experience.

It's here somewhere?



VK2HOT- Sarah Piper



VK2GD - VK2ZCM



Some of the crowd

This annual event is organised and run by the OXLEY REGION AMATEUR RADIO CLUB Inc. which may be contacted at PO Box 712 Port Macquarie 2444. The club would like to thank all participants and sponsors for their continued support.

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• Detachable Front Panel (Req. OPC-600/601 Option)  
• 9600 bps Packet Operation • 500 Memory Channel  
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